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CHAPTER 1. Summary

1.1 Characteristics

SFAX-500, weather fax receiver is a single body type with printer, is receiving 0.5MHz – 25MHz of weatherfax image and available to print on 10" wide paper. at the same time, it displays the same data through 5.6" color LCD and available to save them by 30 images. It's available to print out and display them to LCD monitor when you need.

(1) It controls each function generally by integrating important circuits such as control part, power part, synthesizer part, receiver part and etc.

(2) It is available to control SFAX-500 weather fax receiver with operating a key pad in front.

(3) It is able to save max. 30 images.

(4) It is able to display again and print it out what you saved before.

(5) Receiving DATA from weather information centre as WMO standard

(6) Tuning is available to set on AUTO or Manual for the optimum receiving condition.

(7) You can receive the best quality data with Auto channel receiving setting.

1.2 Compositions

This equipment consists of basic composition and optional composition, mail equipment consists of functional PCB.

NO.		Description	Model number	Unit	Remark
1		Weather fax receiver	SFAX-500	1Set	
	(1)	Part for receiving and synthesizer	P102910	1	
	(2)	Part for control & Power	P102920	1	
	(3)	Front Display	P102950	1	
2		Power cable ASS'Y	SCN3-3M-D3 (P/N:574-0170-01)	1	
3		Installer	INSTALLER (P/N:H02-5001-07)	1	
4		Fix Bolt size	SUS M5X10	5	
			NORMAL M4 X12	3	
5		Fuse	5A, L=20mm	2	
6		Instruction Manual		1	Language select
7		Dust cover	For SFAX-500 weather fax Protection cover	1	
8		Thermal recording paper	I.D. 12/O.D.40/W:260mm (Length of paper:Abt.12m)	1Roll	

[chart 1 Basic composition form]

NO.		Description	Model Number	Unit	Remark
1		Whip Antenna	DAF-30R	1Set	FAX only
2		Antenna Cable	MP-20M(RG58)-0 (P/N:574-0150-02)	1Set	
	(1)	Antenna Coaxial cable	RG-58/U (P/N:568-0058-21)	1EA	20m
	(2)	RF Coaxial connector	MP-C-58 (P/N:586-1401-3S)	1EA	
	(3)	PRESS-RUBBER	RG-58 BUSHING (P/N:714-4000-00)	1EA	
3		Power	SP-310AD	1SET	
4		Thermal recording paper	I.D.12/O.D.40/W:260mm (Length of paper:Abt.12m)	1ROLL	

[Chart 2 Optional composition form]

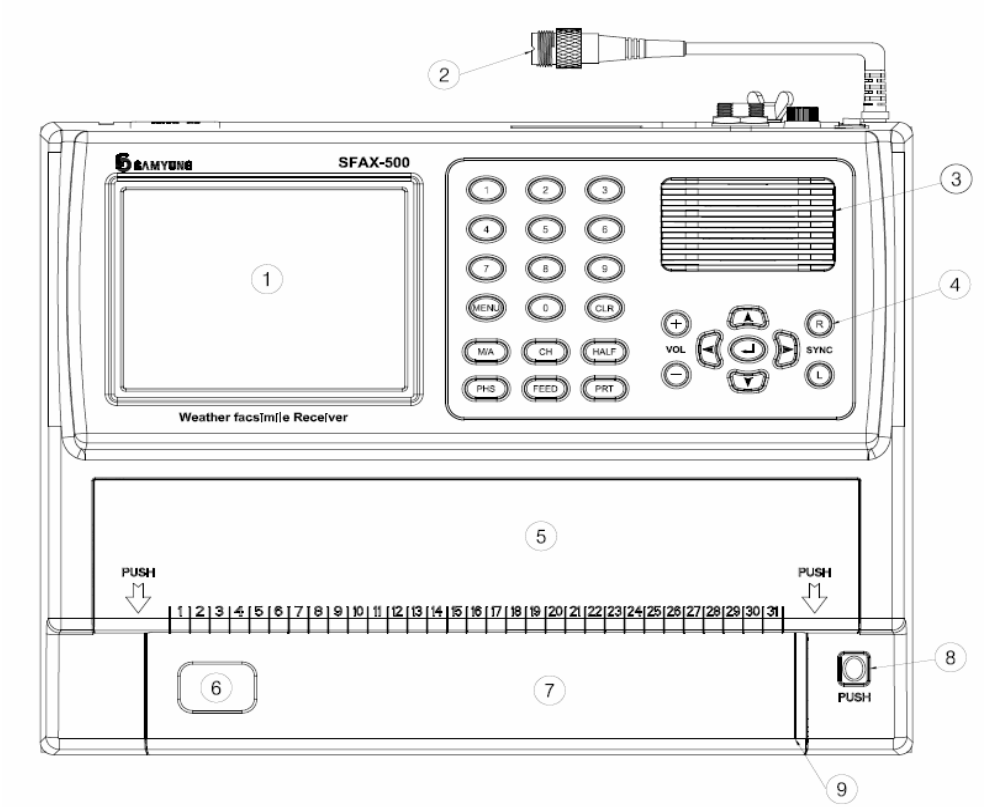
CHAPTER 2. Specification

2.1 Normal Spec.

- o Frequency : FAX 0.5MHz – 25MHz
- o Receiving method : Double super heterodyne method
- o Modulation : FAX(F3C/J3C)
- o Frequency stability : Variation within 10Hz(within 0.3ppm)
- o Channel savable : 30 channels
- o Save capacity : FAX(30 PICTURE)
- o Screen display : Black, White, Gray
- o Recording System : Solid-state recording by thermal head
- o Paper : I.D.12/O.D.40/W:260mm (Length of paper:Abt.12m)
- o Effective recording width : 252.0±0.2mm
- o Index of cooperation : 576 or 288
- o Scanning speed : 60, 90, 120, 180, 240 SPM(Scanning/Minutes)
- o Scanning resolution : 8dots/mm
- o Power voltage : DC 22V ~ 31V (24V -10% ~ +30%)
- o Current consumption : Min 0.5A, Max 5A
- o Antenna : WHIP Antenna(DAF30R) or WIRE Antenna 15M
- o Size : W353 X D273 X H103
- o Weight : 3.6Kg

CCHAPTER 3. Description of Front

3.1 Description of Front and keypad

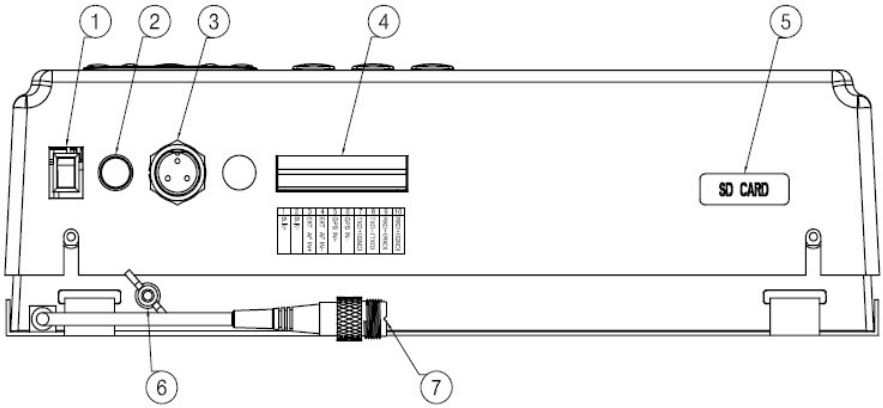


①	LCD	: Displays weather fax image and setting screen.
②	Antenna connector	: Connects to receiving antenna
③	Speaker	: Available to check beep and receiving
④	Key pad	: Keys for operation such as Number, Menu, direction key
⑤	Printer Head Cover	: There are Printer head and printer mechanism in it.
⑥	Recording paper window	: Available to check whether a recording paper in or not
⑦	Recording cradle cover	: Install a thermal recording paper in it
⑧	Open Button	: While installing a recording paper, Mechanism will be opened if you push this button.
⑨	Paper Array Line	: Please set by this line which you withdrew the recording paper.

3.1.1 Keypad

0 ~ 9	: Use when input channel & frequency
MENU	: Open Main Menu
CLR	: Cancel settings or go back the menu before
M/A	: Switch for Auto or Manual of receiving mode
HALF	: Put gray tone on screen
PHS	: Use when control phase
FEED	: For feeding printing paper
CH	: Move to channel setting menu
PRT	: Print received images
+ , −	: For adjust volume
R , L	: For adjust tuning
◀ , ▶ ▲ , ▼	: Move the cursor (you can adjust the screen brightness by up and down arrows upon Receive mode)
↵	: For input setting

3.2 Rear part



① Switch : It is used for power on.

② Fuse(5A) : There is 5A fuse in it.

③ Power (+24V) : Connect to Power to the equipment.

④ Terminal Block : It is used for B.K , external reception input, GPS input and extra RS-422(232).

⑤ SD Card : It is used for inserting SD card for version up or data backup.

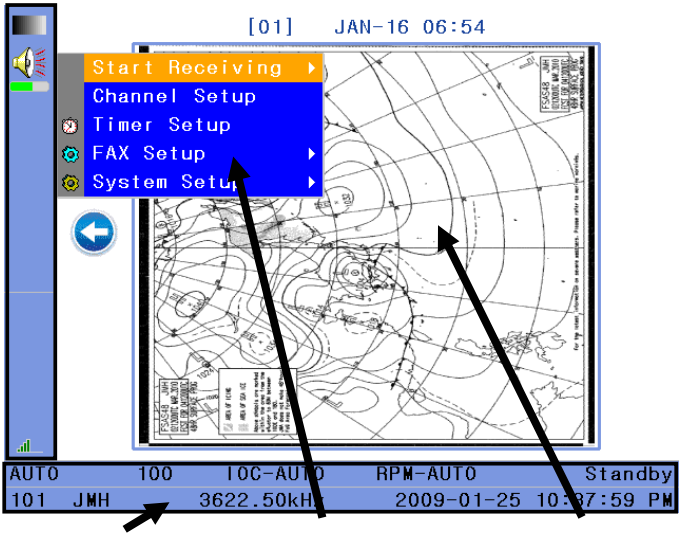
⑥ Earth terminal : Using for Earth

⑦ Input Antenna : Receiving antenna is connected to this part.

3.3 LCD Display

(1) Basic specification

- Basic resolution of LCD is set on 800 X 600.



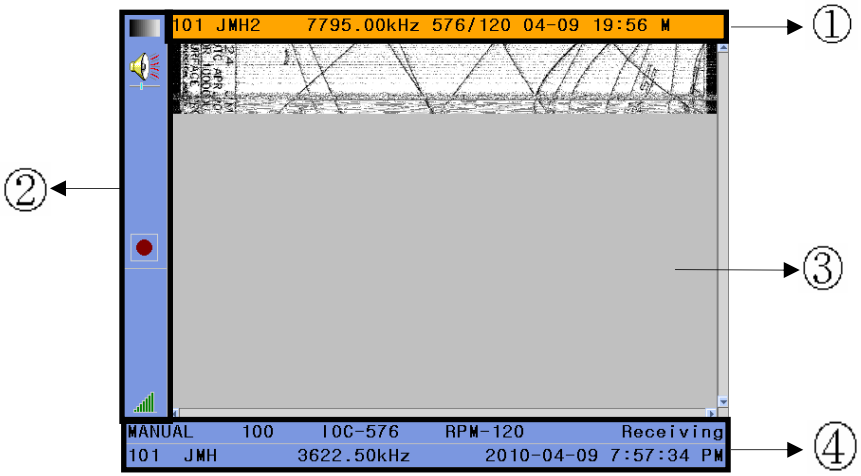
[LCD screen]

(2) Screen display : Displays FAX images

(3) Function display : Available to select function on MENU

(4) Condition display : Displays a frequency receiving, Mode, Date, Time and etc.

(5) Receiving screen



[The screen during receiving weather broadcasting]

① It is displayed the information for receiving images(channel, frequency, IOC/RPM, time, receiving mode)

② It displays a condition of equipment.(Halftone, speaker, receiving condition, antenna condition)

③ It displays the image of weather broadcasting which is been receiving.

④ It displays the information for the channel of weather broadcasting which is been receiving.(channel, frequency, IOC/RPM, time, receiving mode)

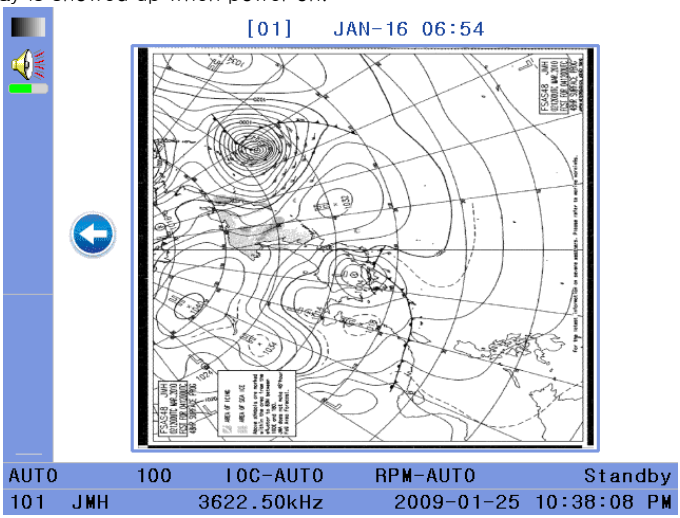
3.4 Icons

	Displays an operation of Gray tone function
	Displays an operation of Black and white tone function
	Displays an operation of speaker and a level with a bar graph
	Displays an operation of GPS
	Displays an operation of an external receiving input
	Displays an operation of diminution function
	Displays this icon when timer is on
	Displays this icon when receiving a weather fax broadcasting
	Displays this icon during printing
	Displays this icon when there is no paper ready
	Displays this icon when there is an error on time(when time data is defective) It disappears after inputting G.P.S or a correct time setting on Date, time Menu.
	Displays this icon if external B.K signal is input
	Displays the level of receiving signal

CHAPTER 4. MENU

4.1 Initial Display

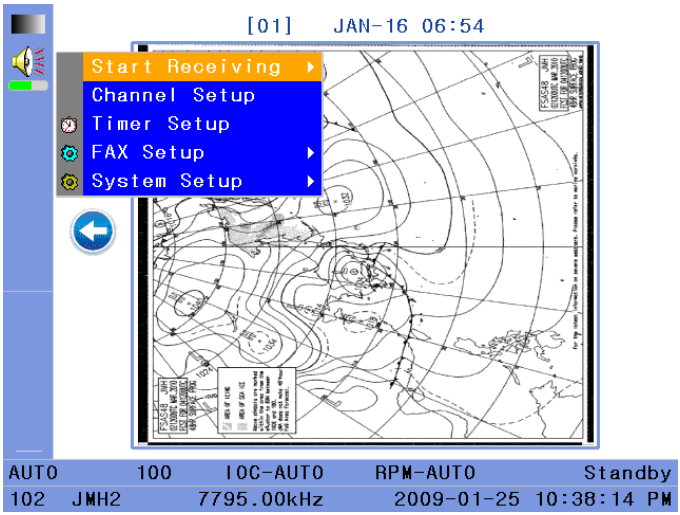
(1) Initial display is showed up when power on.



[Initial display]

(2) You can see Menu screen if you press [Menu] key.

(3) You can move cursor with [direction key], you can see subordinate menu if you press [ENTER].



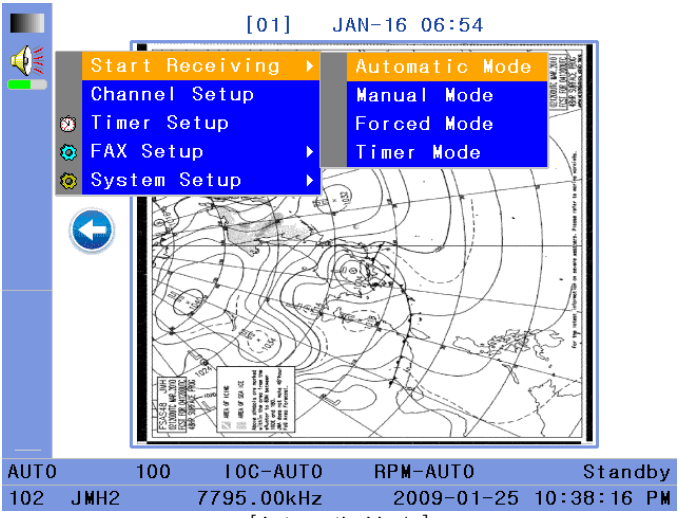
[Menu screen]

4.2 Set up for Start Receiving

For start receiving setting, you can start receiving with selecting one of auto, manual, forced and timer mode.

4.2.1 Automatic Mode

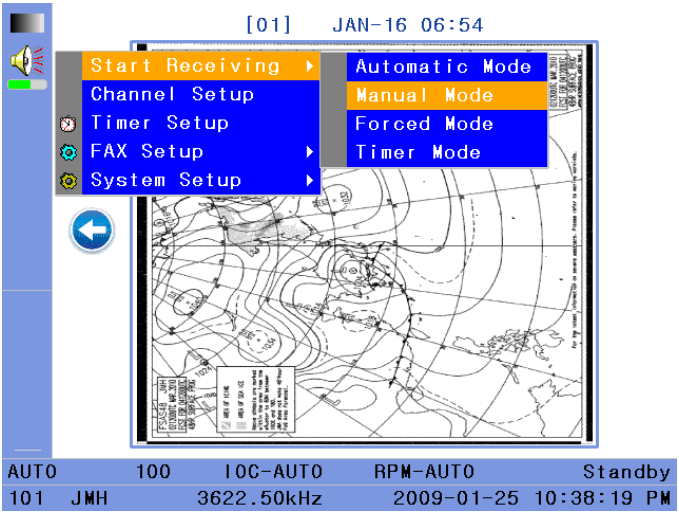
If you select Automatic mode, it starts to record from the start receiving signal comes.



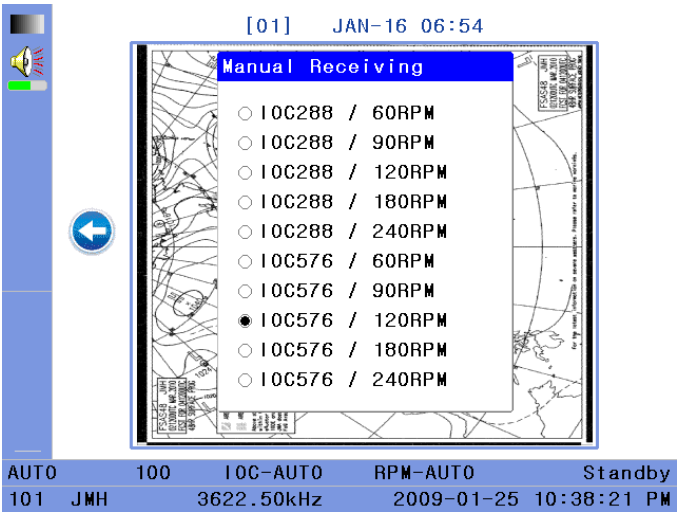
[Automatic Mode]

4.2.2 Manual Mode

If you select Manual Mode, it starts to record from the phase signal comes



[Manual Mode]

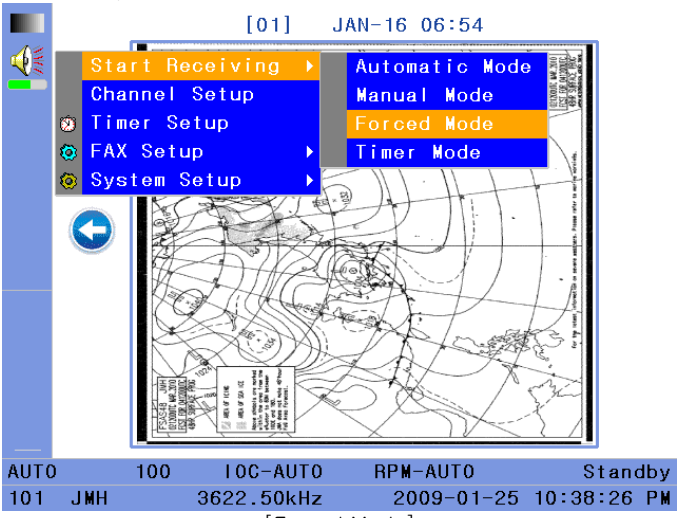


[Internal setting]

※IOC means a resolution of Print, RPM means Motor speed.

4.2.3 Forced Mode

If you select Forced Menu, it starts to record at once.

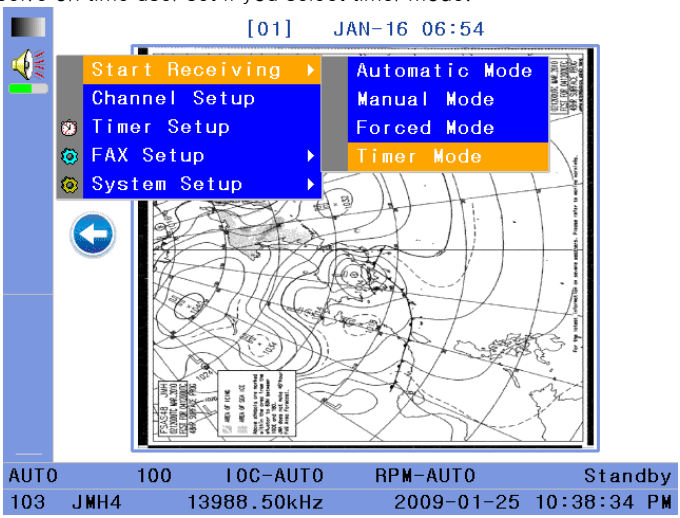


[Forced Mode]

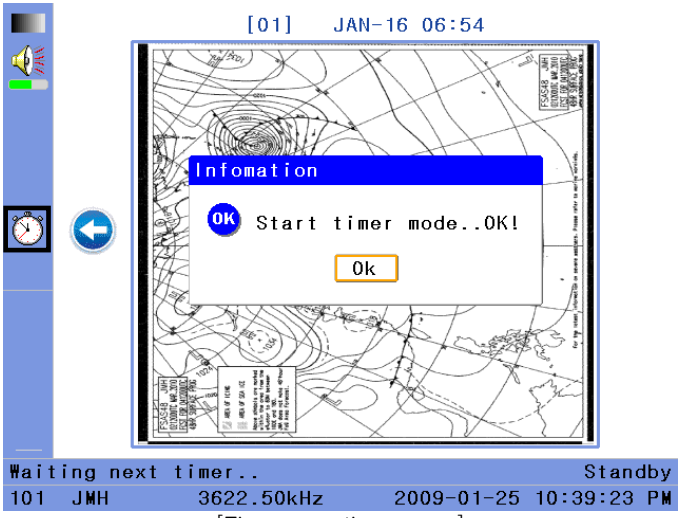
※It is the same as Manual Mode for internal setting.

4.2.4 Timer Mode

It begins to receive on time user set if you select timer mode.



[Timer mode]



[Timer operating screen]

※You should complete a timer setup in order to use timer mode.(Refer 4.4 Timer Sepup)

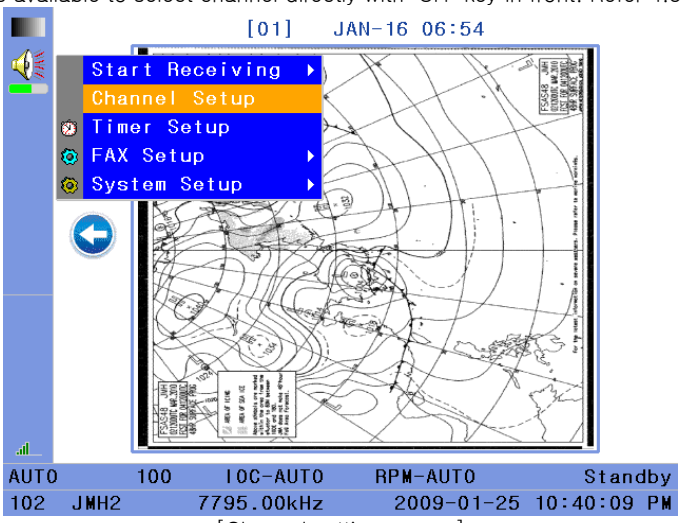
※You can see icon during timer mode operating.

(2) During Timer Mode standing by, automatically it works Clock mode if there's no input more than 1minute.

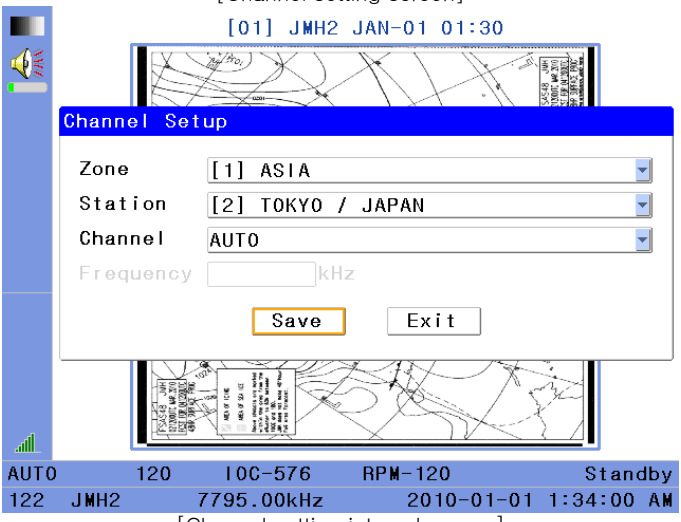
※During clock mode, it goes back to before screen if there's any input

4.3 Channel Setup

For receiving broadcasting what you want, this function is to select zone, station, channel, frequency.(It is available to select channel directly with 'CH' key in front. Refer 4.3.5)



[Channel setting screen]

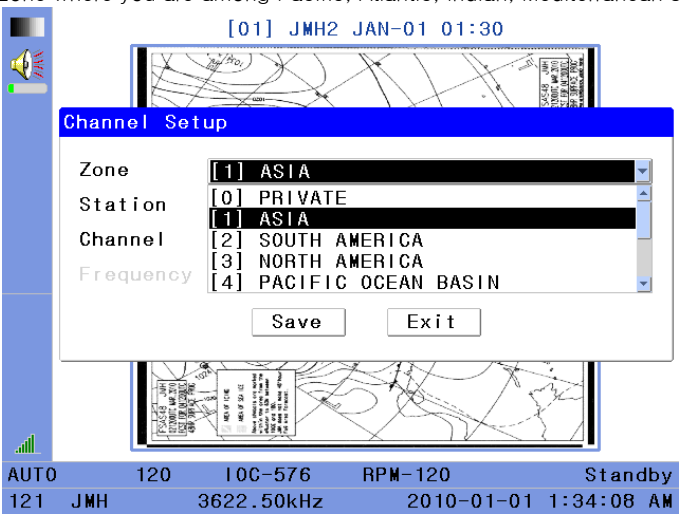


[Channel setting internal screen]

- It is available to select 'Zone/Station/channel/Frequency with [Direction key].
- Zone : Select Zone among Asia, America, Pacific Ocean Basin, Europe, Africa.
- Station : Select one in the zone.
- Channel : Select a channel available from a station
- Frequency: if you want to select a channel directly, you can put the channel address directly with [Number] key.

4.3.1 Zone

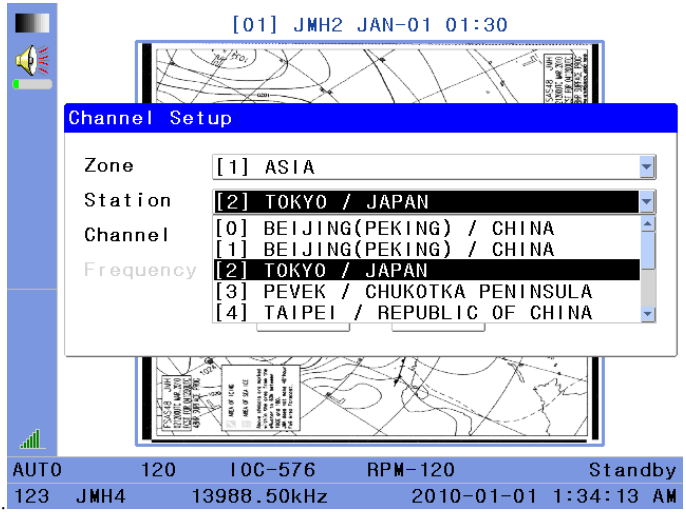
Please select Zone where you are among Pacific, Atlantic, Indian, Mediterranean sea, Persia.



[Zone setting]

4.3.2 Station

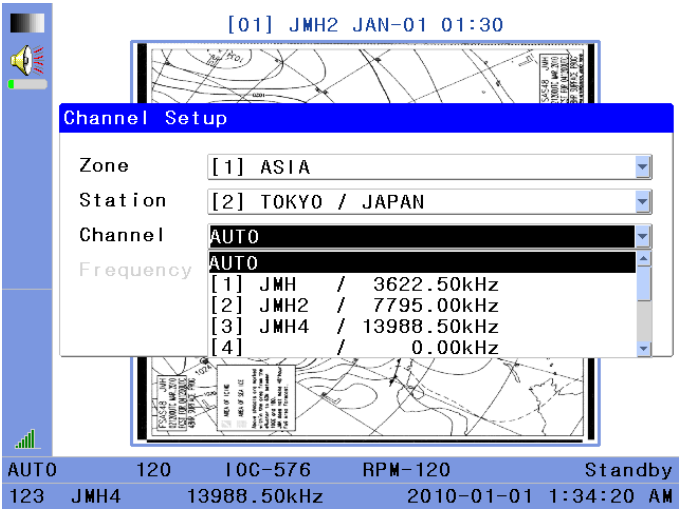
Select Station(Nation) in order to receive weather fax broadcasting in your zone.



[Station setting]

4.3.3 Channel

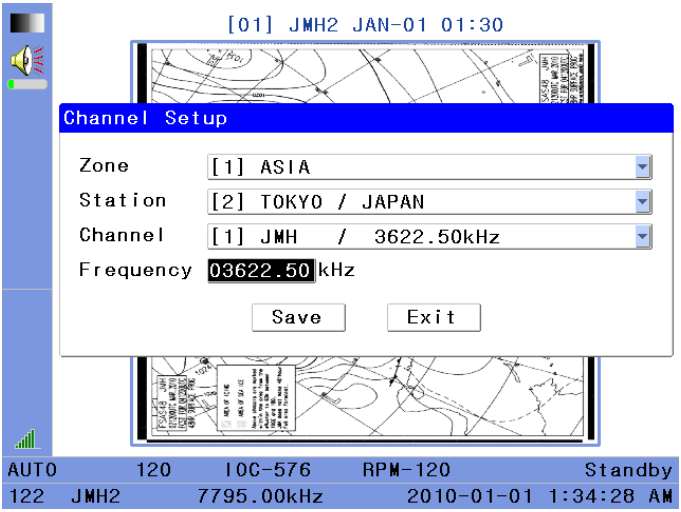
Select one of the channels of station which user selected. It is automatically connected to the channel which is good for reception condition



[Channel setting]

4.3.4 Frequency

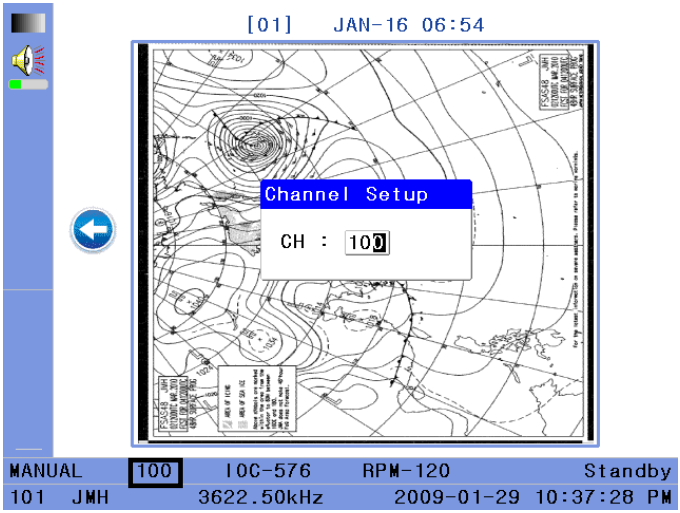
Set Frequency and please put frequency address directly.



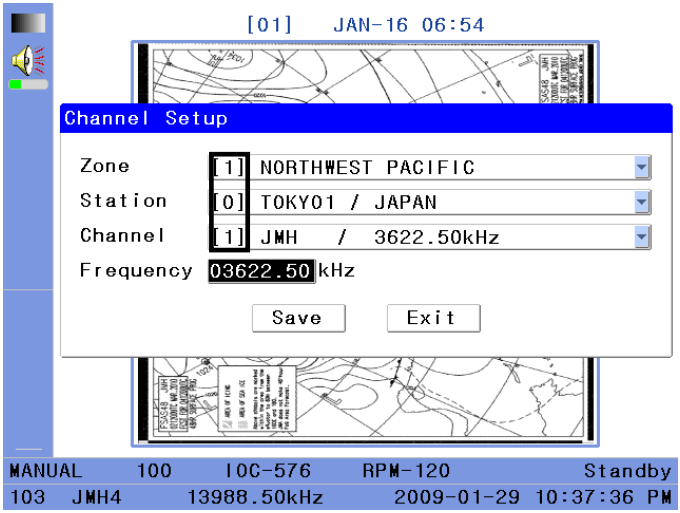
[Frequency setting]

4.3.5 Direct channel setting

This function is select channels directly with keypad



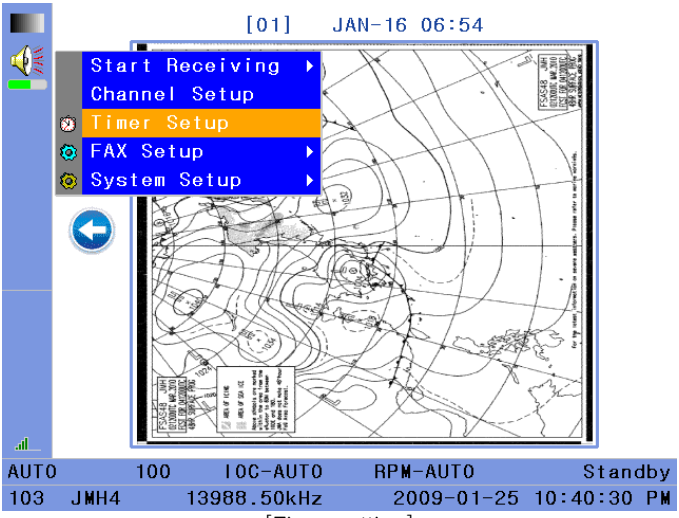
Channels setting ex)



- The initial number in the box is channel number.

4.4 Timer Setup

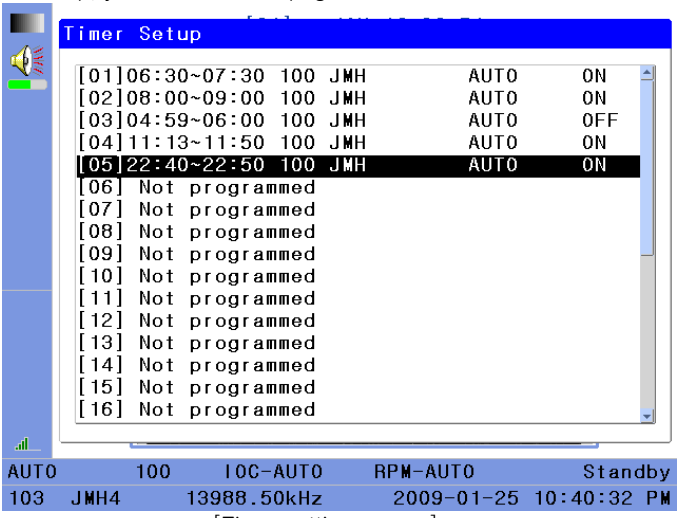
This function is for receiving data automatically on the time what user set.



[Timer setting]

4.4.1 Edit

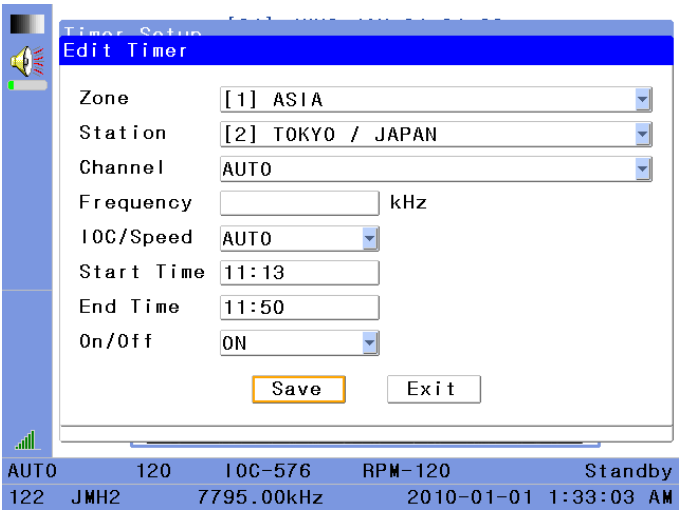
If you select Timer Setup, you will move this page as below.



[Timer setting screen]

- You can select multi-ply when time is different.
- When 'off' is on the setting screen, Timer mode is not working.

Press [ENTER] key where you want to set in the list, and then you can set timer as below.

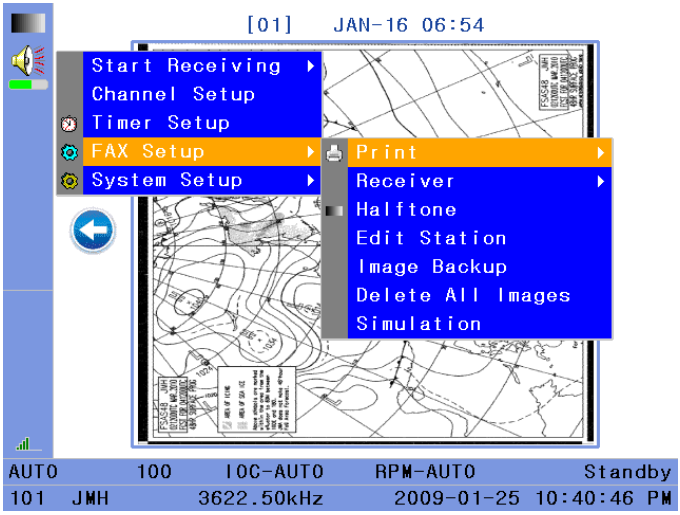


[Timer setting]

- Set 'Zone/Station/Channel/Frequency' the same as channel setting.
- IOC/Speed : means resolution for image receiving and printing speed
-Start, End time : Set a start time and end time for receiving data
- On/Off : select timer on or timer off
- Save/Exit : Save setting data / go back to Menu list.

CHAPTER 5. FAX MENU

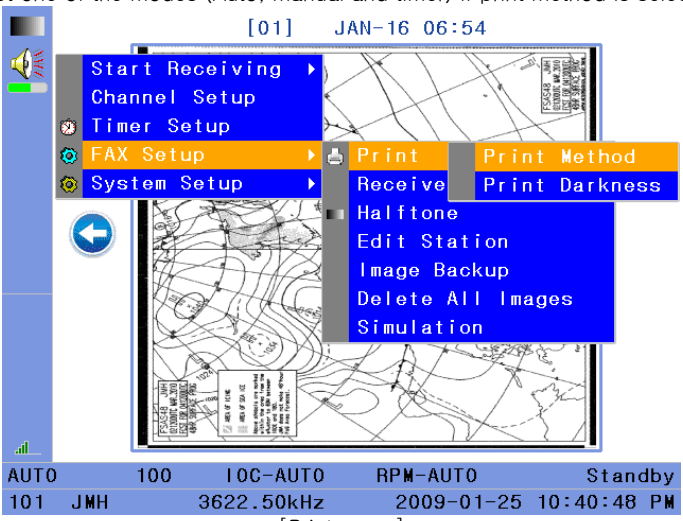
5.1 Print



User can set print method and darkness for printing.

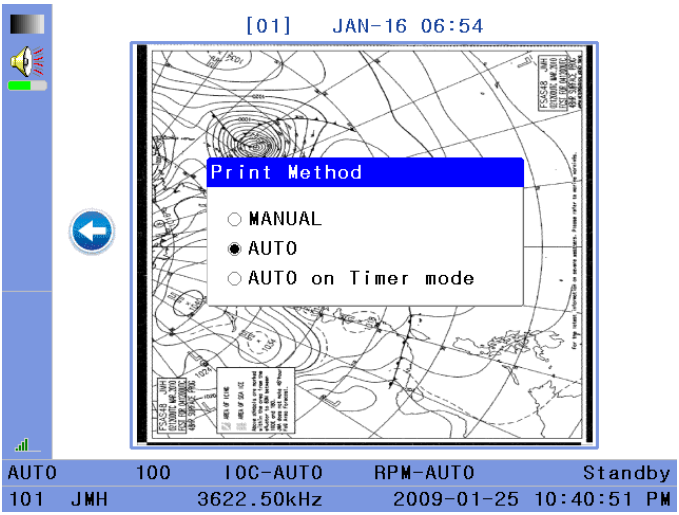
5.1.1 Print Method setup

User can select one of the modes (Auto, manual and timer) if print method is selected.



[Print menu]

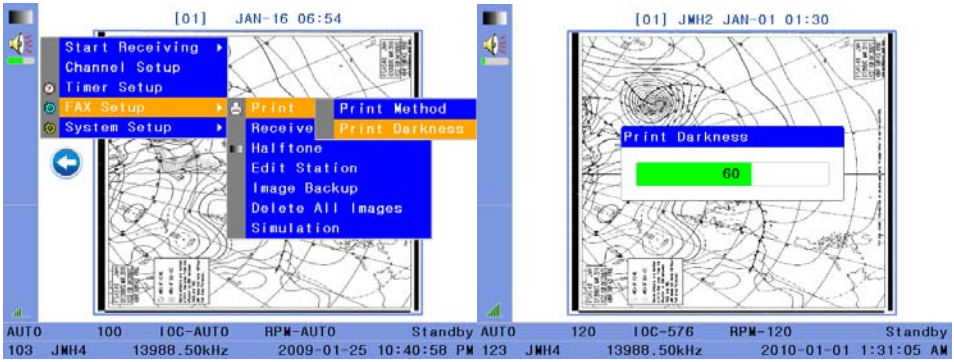
(1)Manual, Auto and Timer mode



- If manual is selected, it can be printed the receiving image desired by user.
- If Auto is selected, all of the receiving images are printed.
- If Auto on Timer mode is selected, the receiving images in timer mode are printed automatically.

5.1.2 Darkness setup

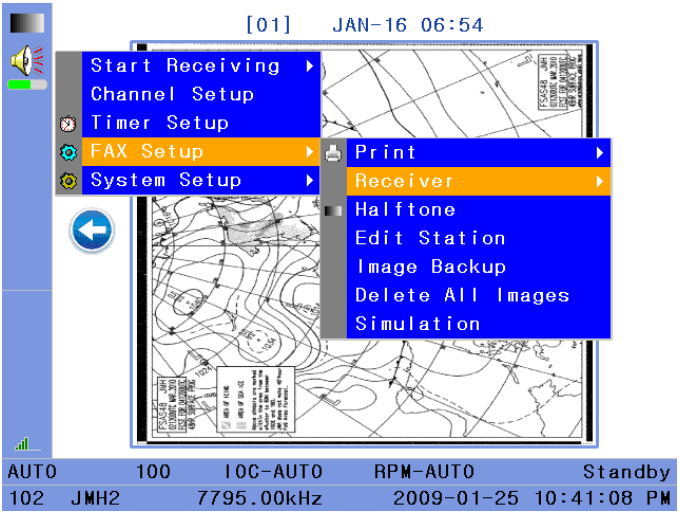
Darkness is adjusted over 10 ~ 100 by using direction button.



[set up Darkness]

5.2 Receiver

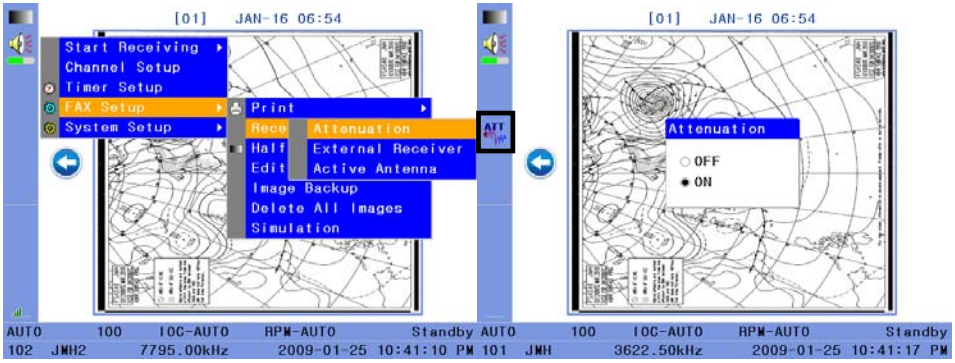
It allows user to set Attenuation, External receiver and Active antenna related to receiving.



[Menu of receiver]

5.2.1 Attenuation setup

If the RX signal is strong, user can set up attenuation (20Db).

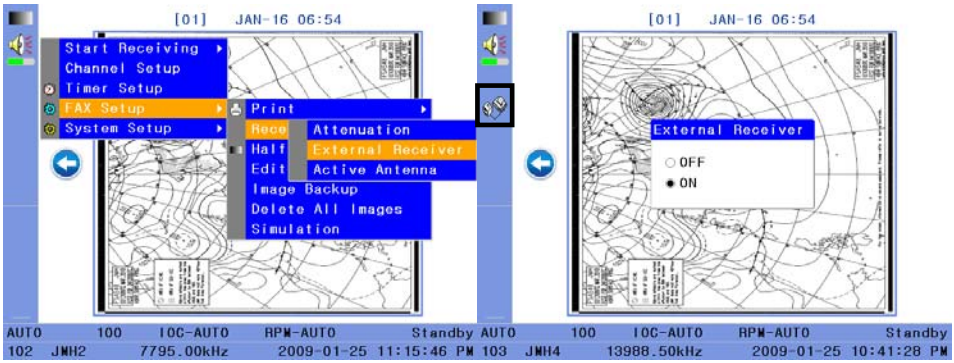


[Attenuation]

※ ATT Icon is displayed when the function of Attenuation is operated.

5.2.2 External receiver setup

User can set the status of external receiver.

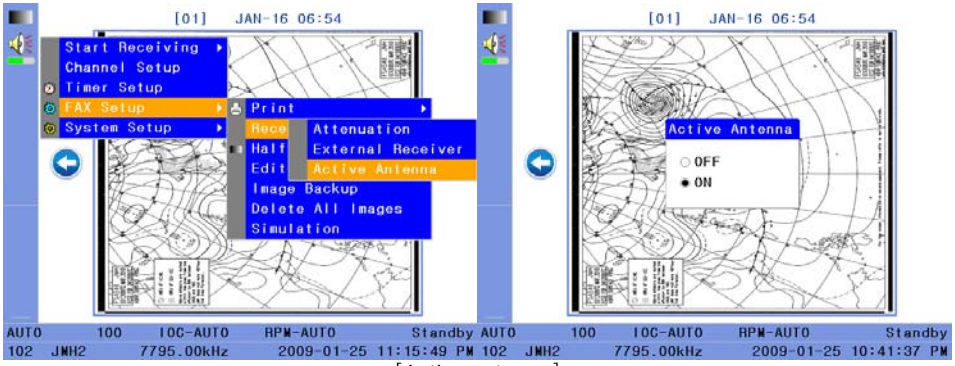


[External receiver]

※ Icon is displayed when external receiver is operated.

5.2.3 Active Antenna setup

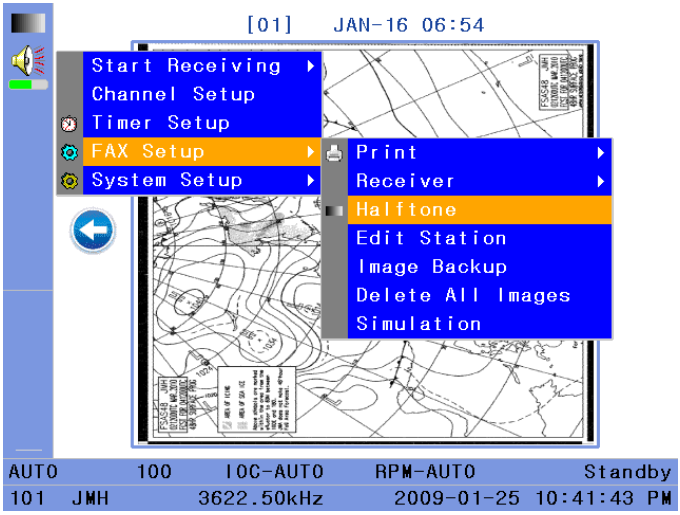
User can set the status of active antenna.



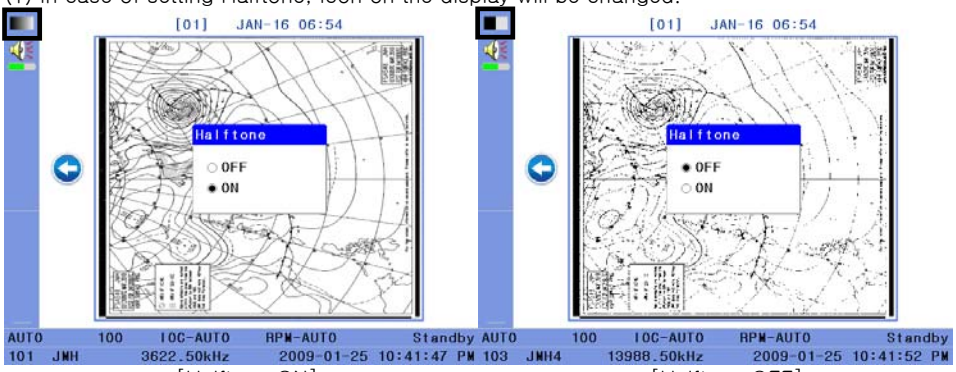
[Active antenna]

5.3 Halftone setup

The receiving signal, selected to black or grey tone color, is transacted.



(1) In case of setting Halftone, Icon on the display will be changed.



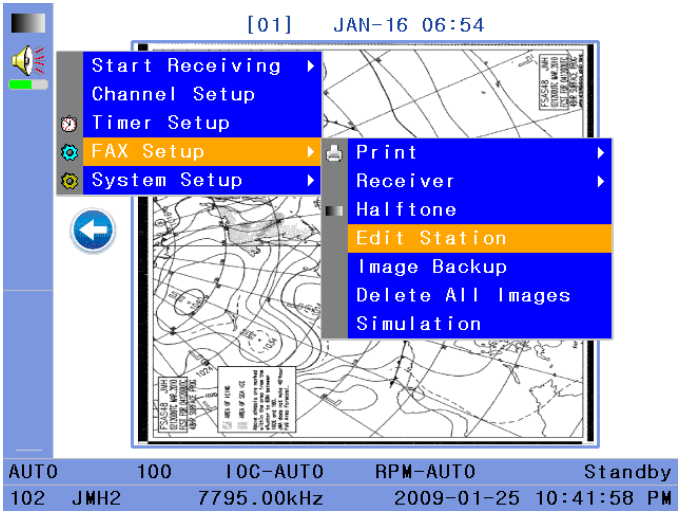
[Halftone ON] [Halftone OFF]

※ Icon means Grey tone (16 darkness) is set.

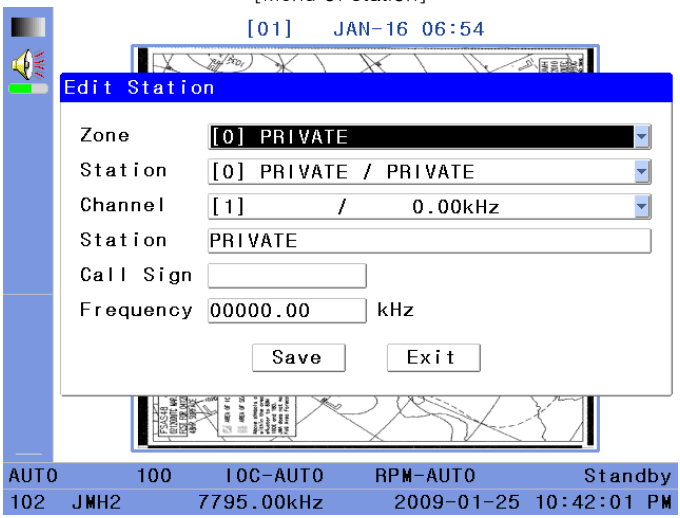
※ Icon means Black tone (2 darkness) is set.

5.4 Edit Station

It allows user to set the desired station.



[Menu of station]

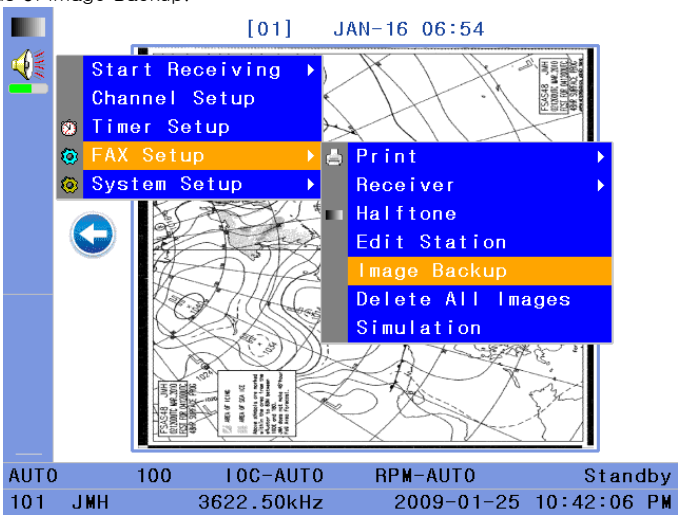


[Picture of Edit station]

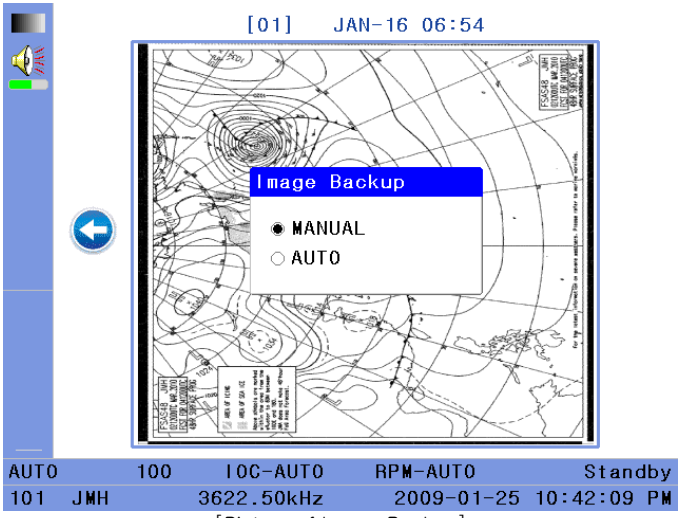
- Set Private in Zone.
- Set Private in Staion.
- For Channel, select the channel desired.
- User can set Call Sign at user's option
- Set Frequency to be received.

5.5 Image Backup

Check the status of Image Backup.



[Menu of Image back up]

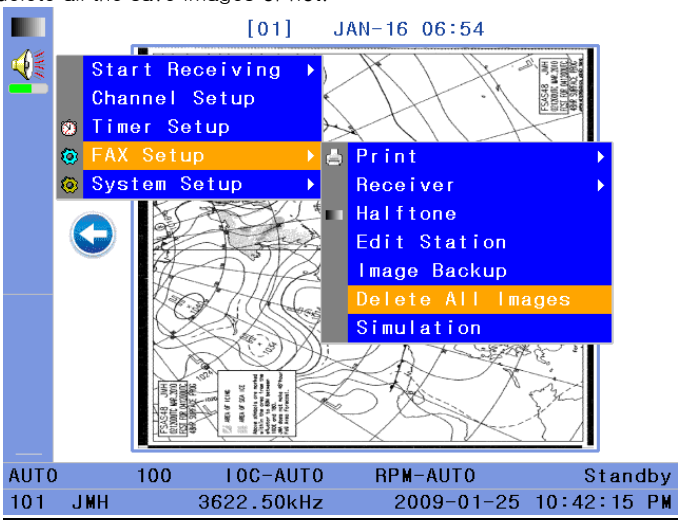


[Picture of Image Backup]

- In case of selection of Manual, images can be saved over 30 images in memory. If the saved images exceed 30, the saved images are deleted from first image. (It can not be saved in SD card)
- In case of selection of Auto, internal memory is same as Manual mode. All the RX images are saved in SD card automatically.

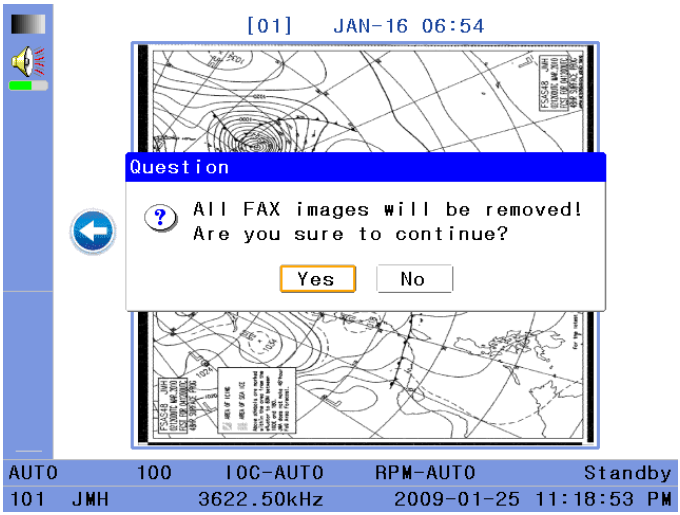
5.6 Delete All Images

Check if user delete all the save images or not.



[Picture of Delete all Images]

※ Check it again before deleting all images.

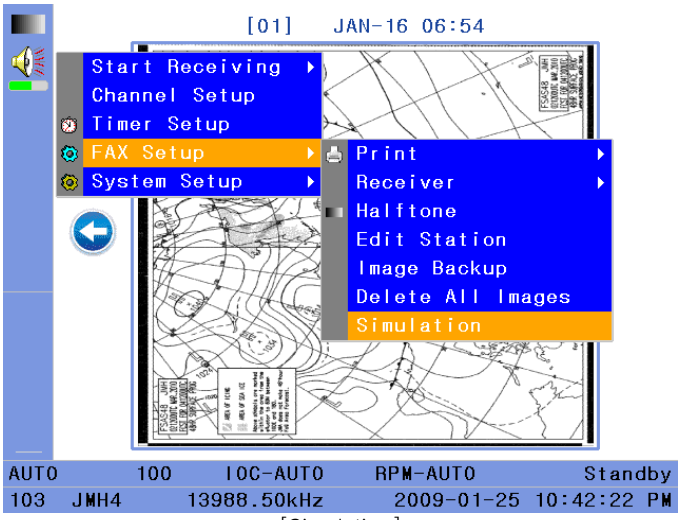


[Before deleted all images]

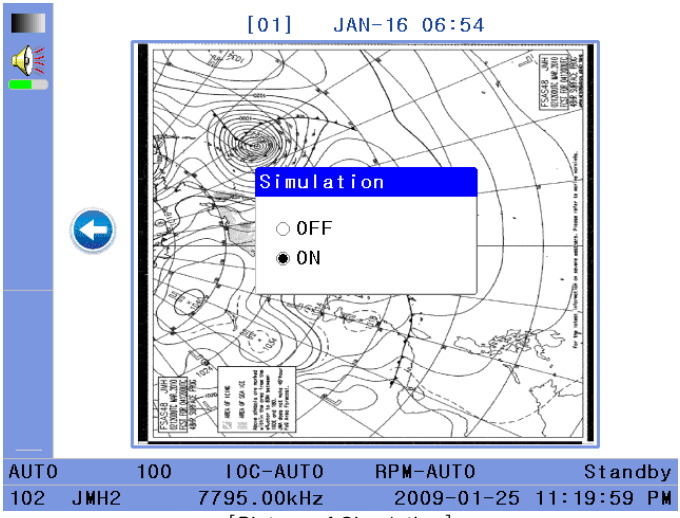
※ It can not be restored after deleted.

5.7 Simulation

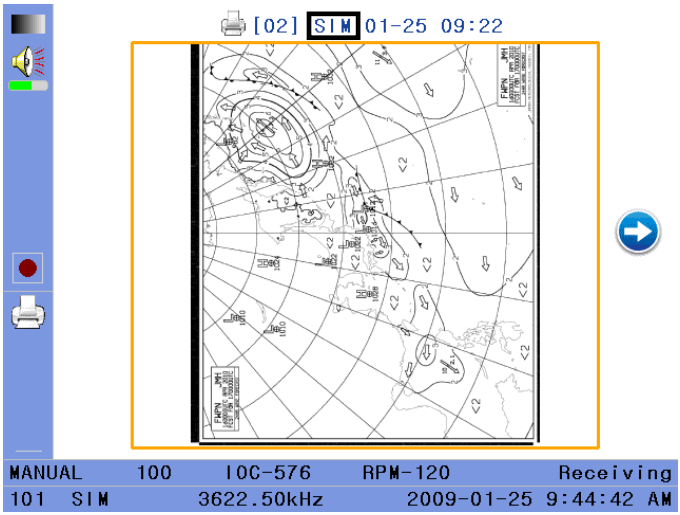
It is the function of testing of operation without actual communication.



[Simulation]



[Picture of Simulation]



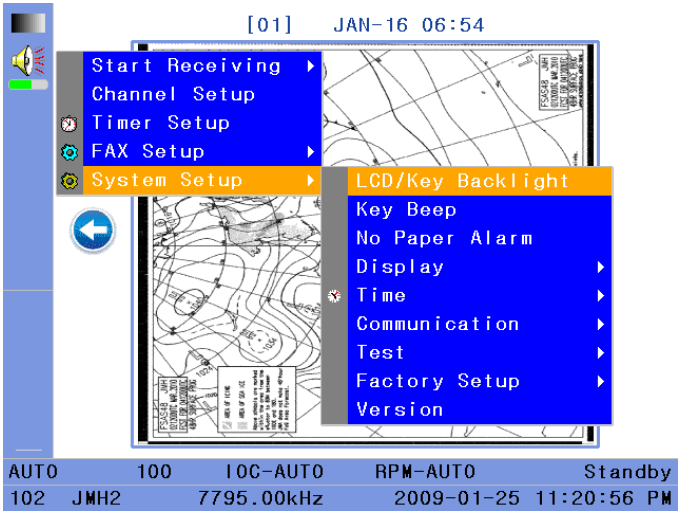
[Picture of Simuation]

※ In case of simulation, SIM will be showned.

CHAPTER 6. SYSTEM SETUP

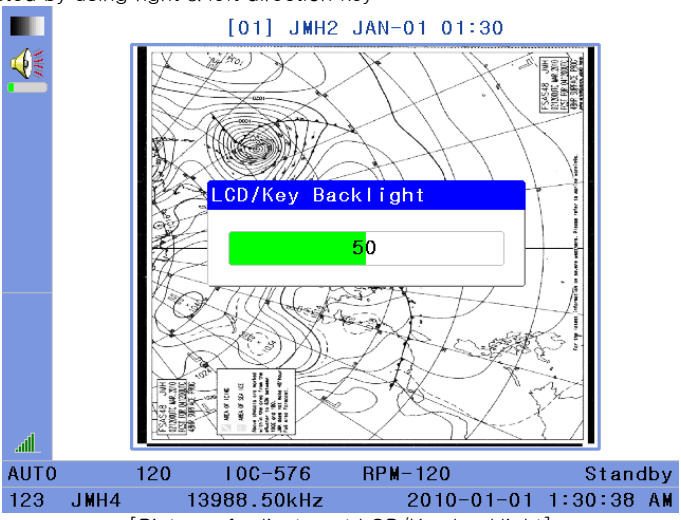
6.1 LCD-KEY board Backlight

User can adjust the brightness of LCD and keyboard backlight.



[LCD/Key backlight]

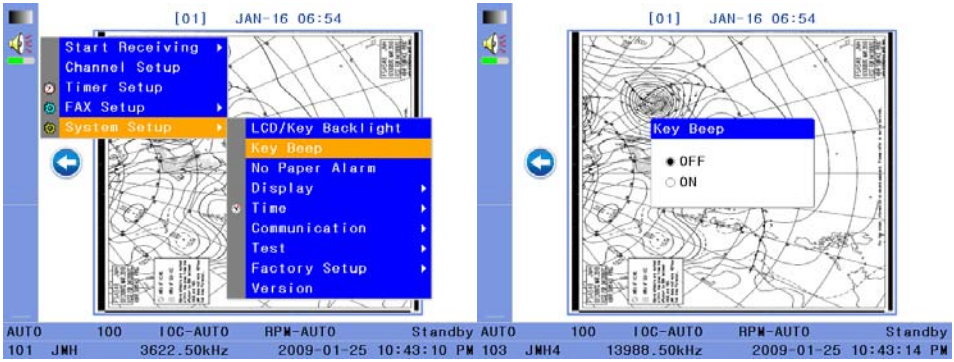
It can be adjusted by using right & left direction key



[Picture of adjustment LCD/Key backlight]

6.2 Key Beep setup

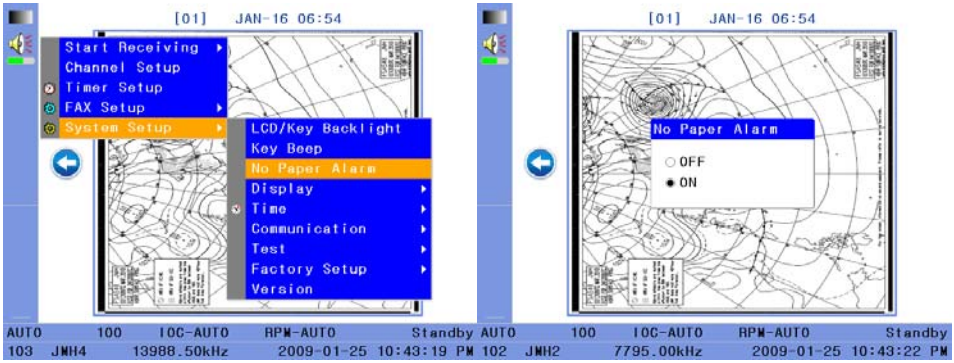
User can set key beep which is happened when pressed key button.



[Setup key beep]

6.3 No Paper Alarm

User can set No Paper Alarm for alarm sound when there is no paper.



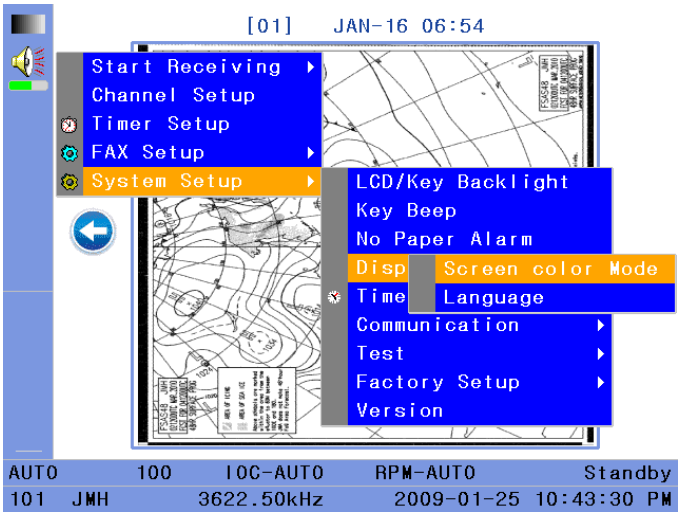
[No paper alarm]

6.4 Display setup

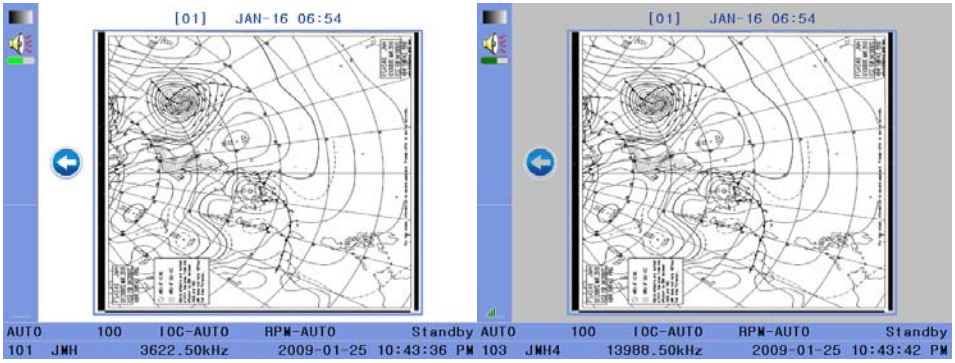
In this menu, User can set Screen color Mode and Language.

6.4.1 Screen color Mode

User can set the screen color of outside of image to Daylight mode or Night mode.



[Screen color Mode]


[01] JAN-16 06:54
AUTO 100 IOC-AUTO RPM-AUTO Standby
101 JMH 3622.50kHz 2009-01-25 10:43:36 PM
[01] JAN-16 06:54
AUTO 100 IOC-AUTO RPM-AUTO Standby
103 JMH4 13988.50kHz 2009-01-25 10:43:42 PM

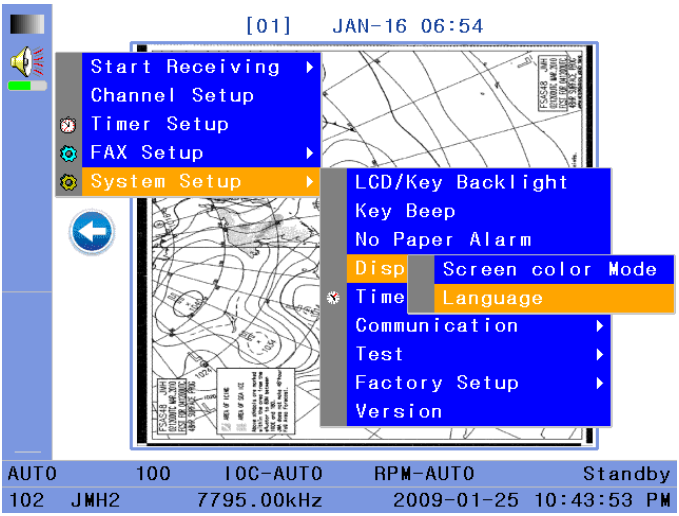
[Daylight Mode] [Night Mode]

- In Daylight Mode, the outside of the image is shown as white color.

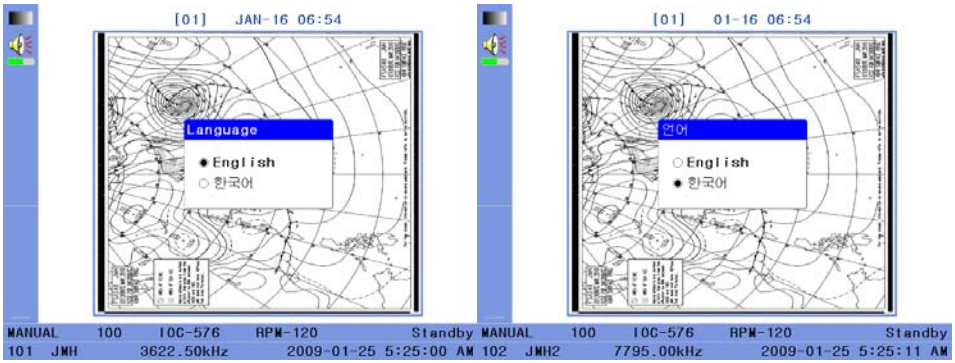
- In Night Mode, the outside of the image is shown as dark grey color.

6.4.2 Language setup

User can select language to English or Korean



[Language]



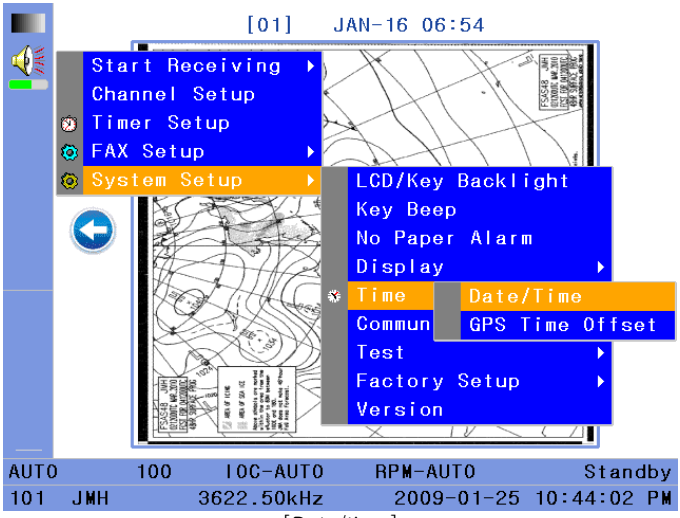
[Setup language]

6.5 Time Setup

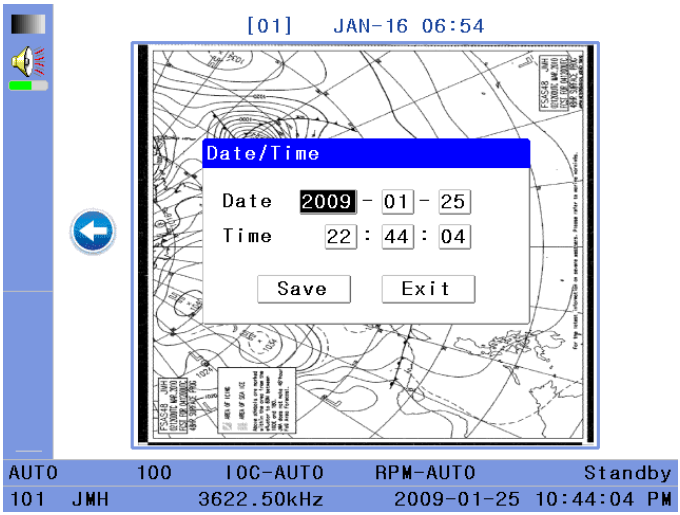
User can set the time deviation of the unit's time and GPS input.

6.5.1 Date/Time setup

User can set a current date / time of the unit.



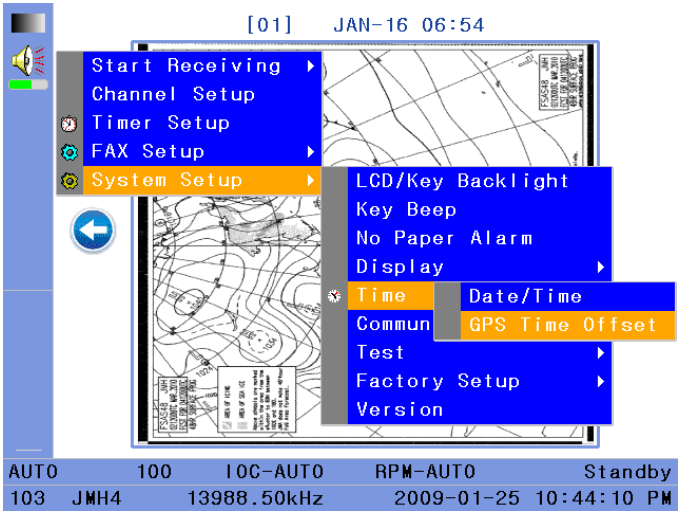
[Date/time]



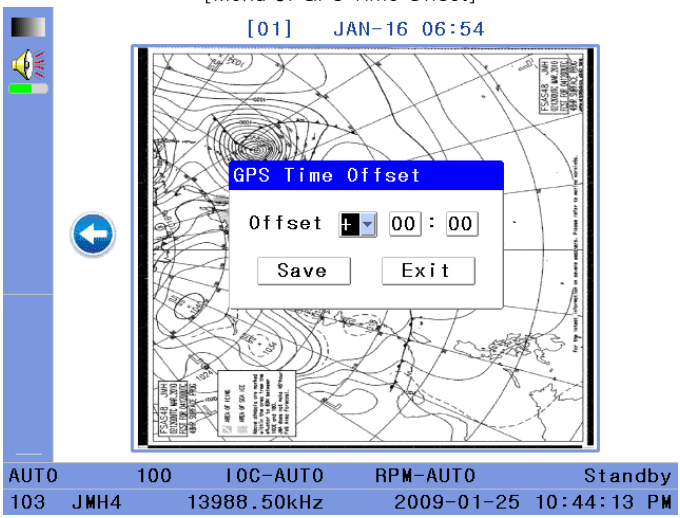
[Date/time setup]

6.5.2 GPS Time Offset Setup

User can set a function to offset the GPS time differences.



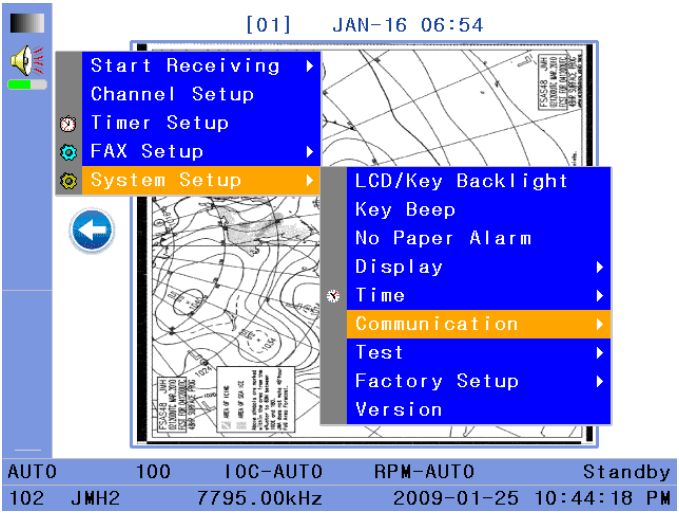
[Menu of GPS Time Offset]



[GPS Time Offset Setup]

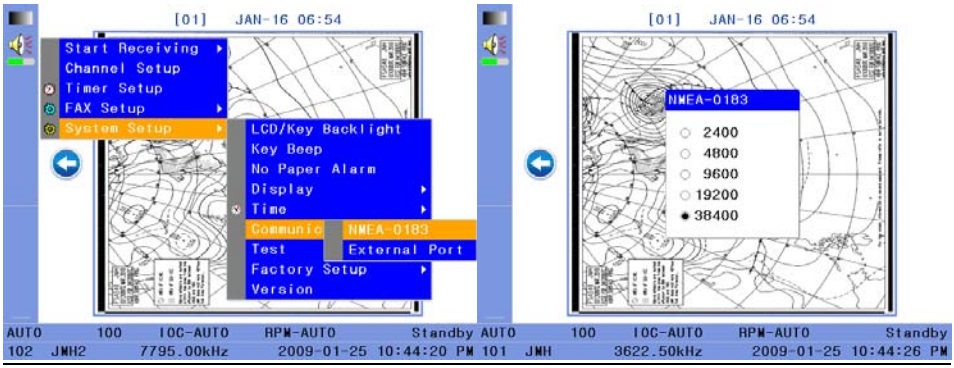
6.6 Communication Setup

User can set communication environment by using external connection terminal.



[Communication Setup]

6.6.1 NMEA-0183

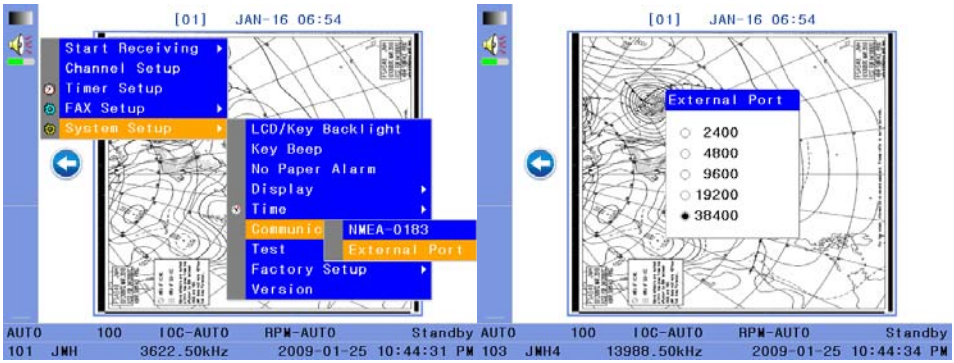


[NMEA-0183 Setup]

※ NMEA-0183 is port for receiving GPS signal.

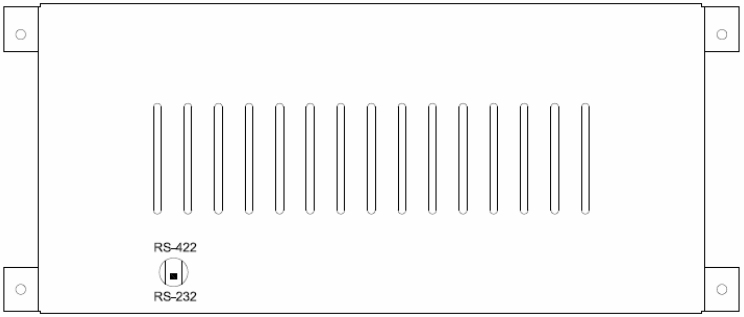
※ Set up the communication speed of external device on the same speed as SFAX-500.

6.6.2 External Port



[Export Port Setup]

※ User can set RS-232, 422 Communication through the switch of the CUP Board.



[Internal CPU shield]

① Open the cover of printer head by pressing the printer open,

② Unlock the bolts of the shield for paper, and also unlock the bolt of the back side.

③ After removed the connectors of keyboard PCB, tip back the keyboard PCB.

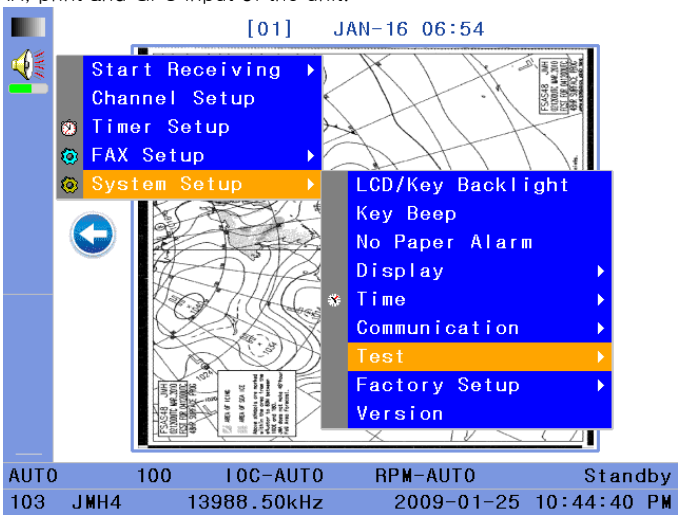
④ If user pull the switch of the hole of CPU shield to downward direction, the RS-232 communication will be set. If user pull it to upward direction, the RS-422 communication will be set.

- RS-232 to be set when taking out the goods.
- Set up the communication speed of external device on the same speed as SFAX-500.

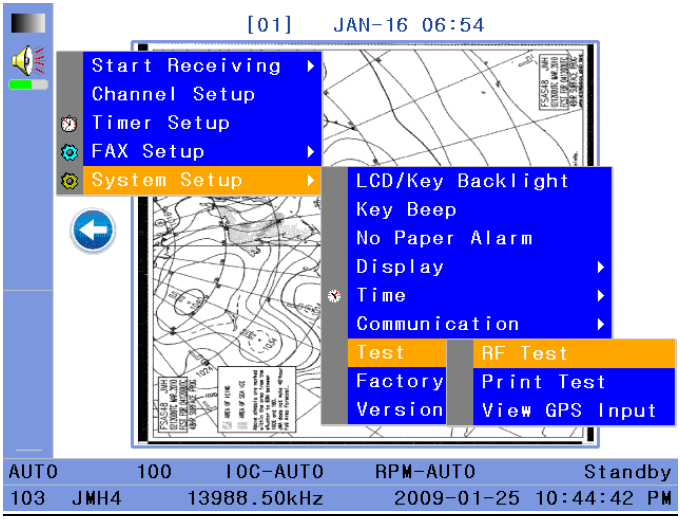
※ In case of user's random operation, it is possible to cause a breakdown.

6.7 Test Setup

User can test RX, print and GPS input of the unit.



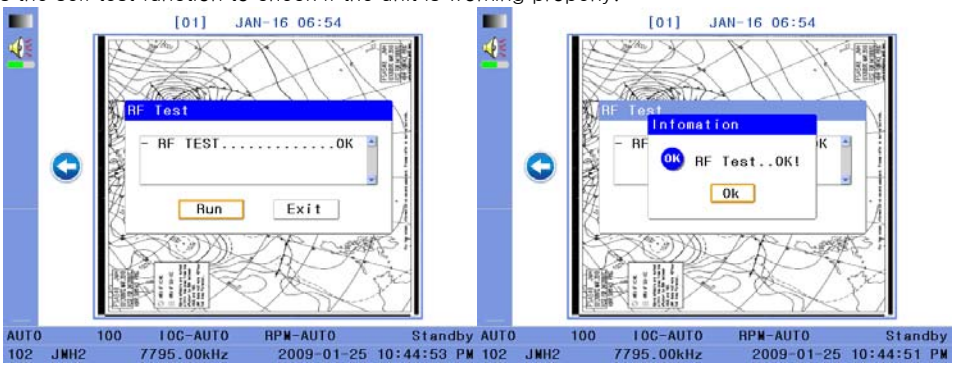
[Test Mode]



[Test Menu]

6.7.1 RF Test

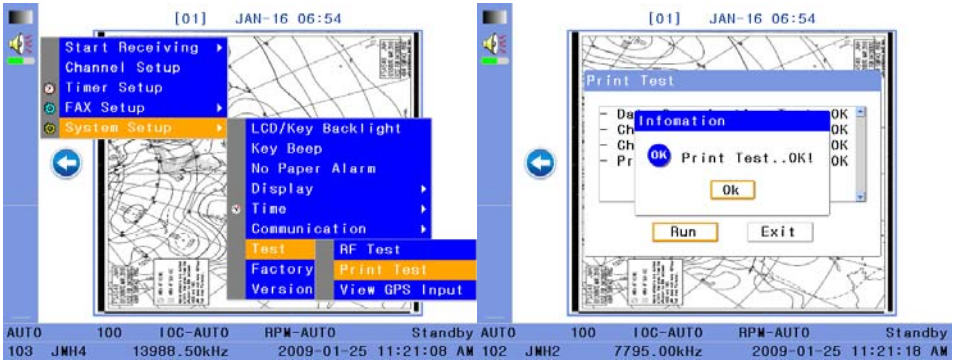
Is the self test function to check if the unit is working properly.



[RF Test]

6.7.2 Print Test

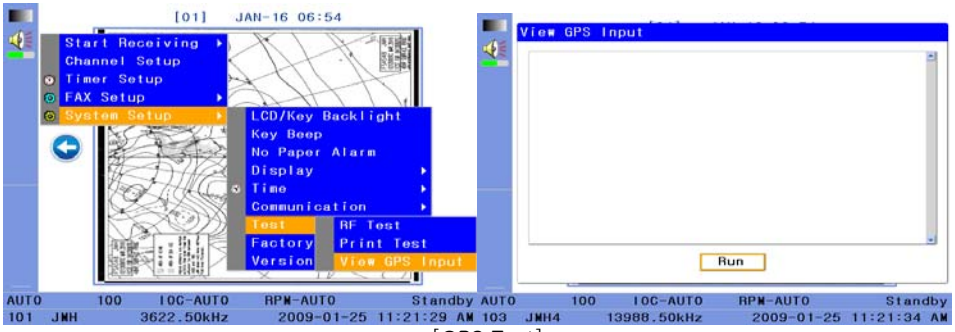
This is the function to check the status of operation of printer.



[Print Test]

6.7.3 View GPS Input

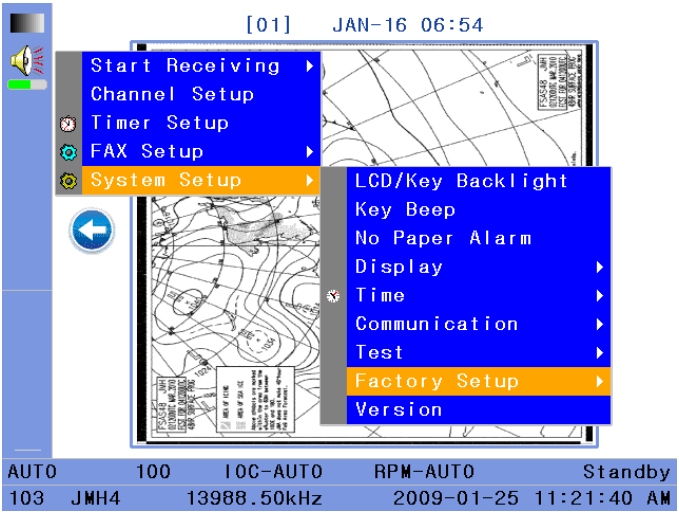
This is the function to check the RX condition of GPS signal in case of connecting external GPS device.



[GPS Test]

6.8 Factory Setup

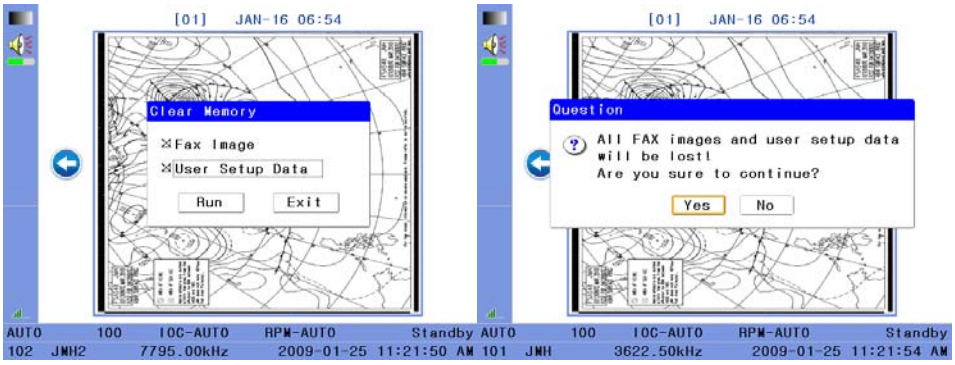
User can initialize the unit / memory and upgrade software.



[Factory Setup]

6.8.1 Clear Memory

This function allows users to initialize the memory of the unit and the user's setup data.



[Menu before initialization of memory] [Menu before initialization]

- In clear memory mode, it is available to initialize by selecting fax image or user setup.

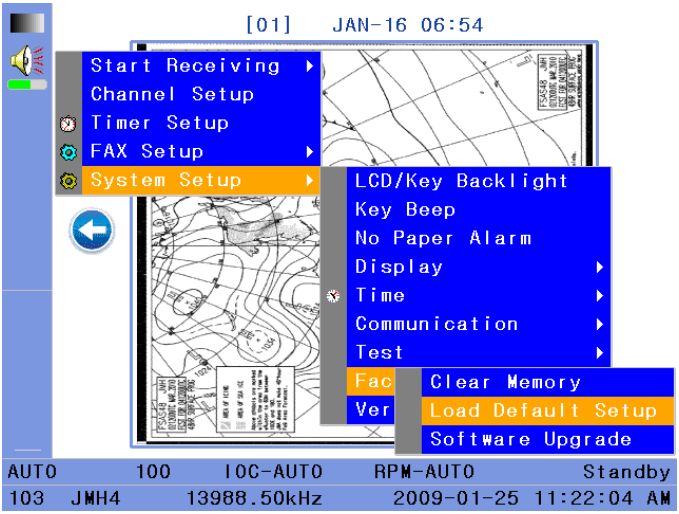
(In case of initialization of fax image, both external/internal memories are deleted.)

- Before initialization, check it again if the initialization is required.

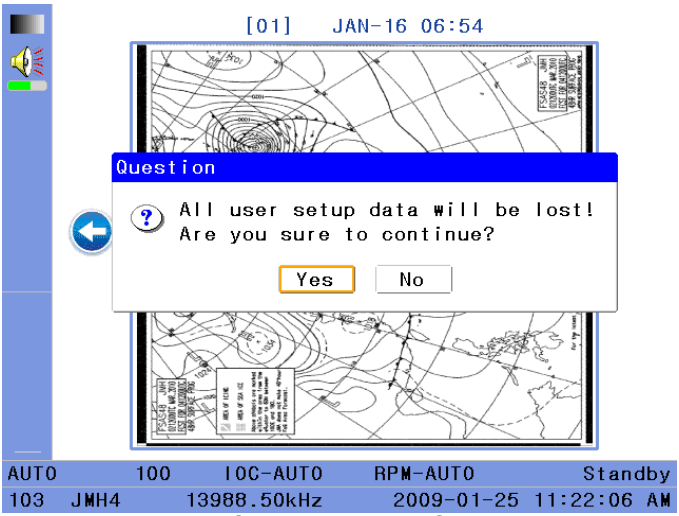
- The deleted data can not be restored.

6.8.2 Load Default Setup

It makes the setup condition return to initial condition.



[Load Default Setup]



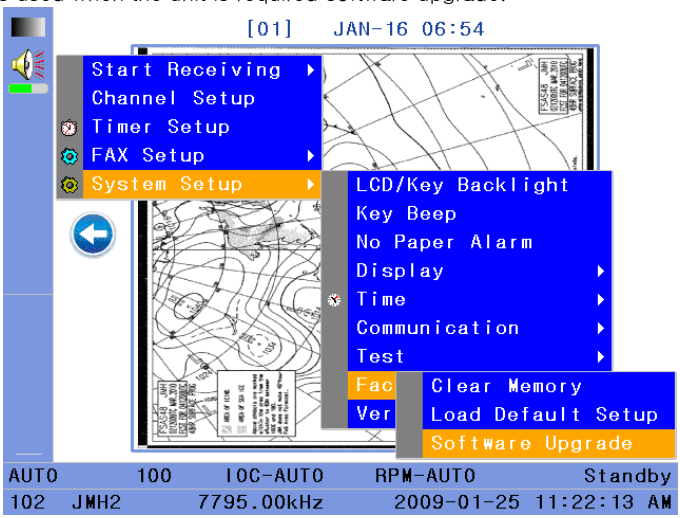
[Load Default Setup]

※ Before initialization, check it again if the initialization is required.

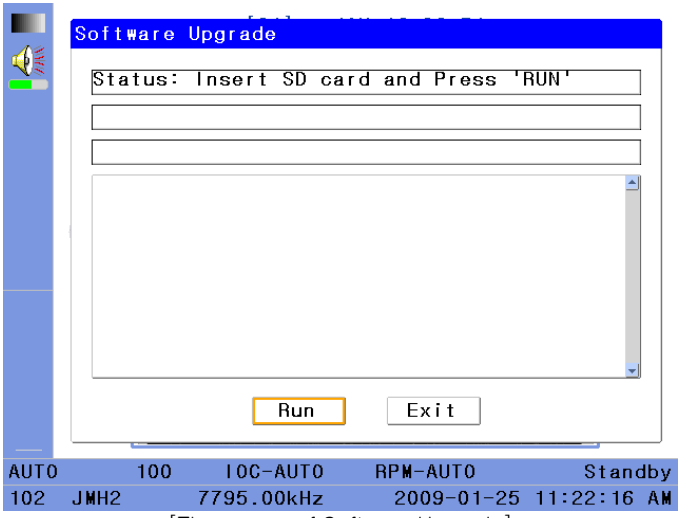
※ The deleted data can not be restored.

6.8.3 Software Upgrade

This function is used when the unit is required software upgrade.



[Software Upgrade]



[The screen of Software Upgrade]

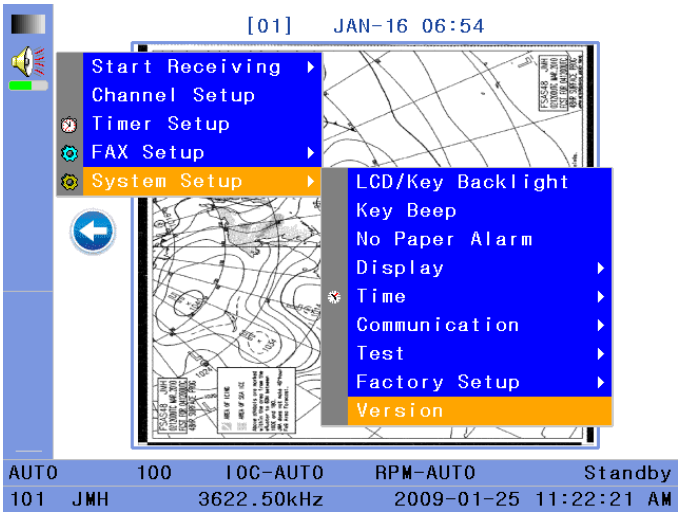
- Execute 'RUN' after inserting the SD card with the software for upgrading to the socket.
- Turn the unit off after checking the completion of software update.

※ If the power is off for upgrading the software, it causes a breakdown.

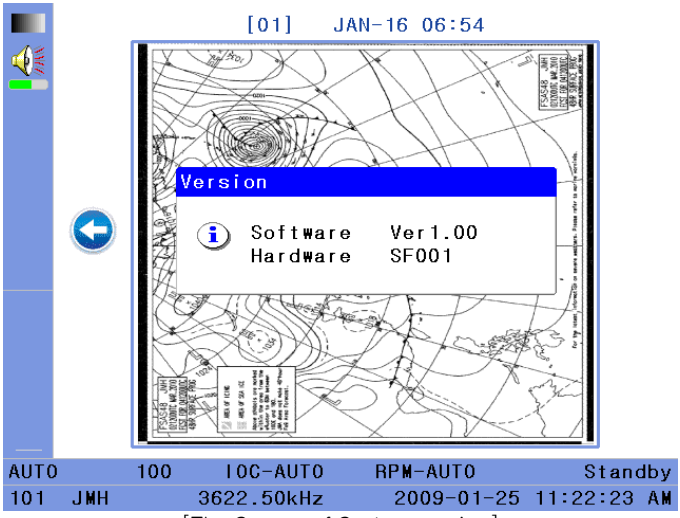
※ 2G SD Memory is not supported. (SCHC memory is supported)

6.9 System Version

This is the function to check a version of unit.



[System Version]

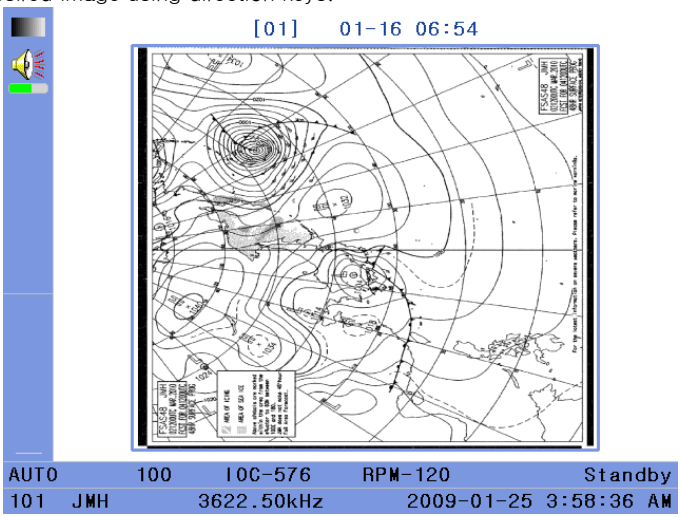


[The Screen of System version]

CHAPTER 7. IMAGE SETUP

7.1 Initial Screen

(1) Select a desired image using direction keys.



[Initial Screen]

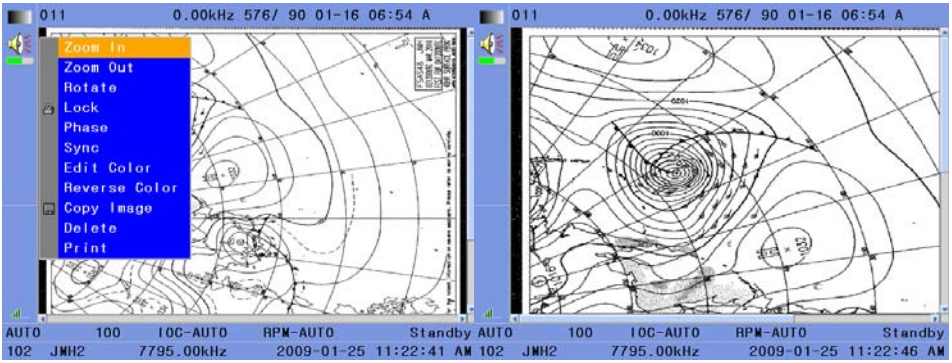
(2) If [ENTER] key is pressed, the image is selected.

(3) If [MENU] is pressed, image setup menu is displayed.

(4) User can move a cursor by selecting [Direction key], and the selected menu is executed if [ENTER] is pressed

7.2 Zoom In

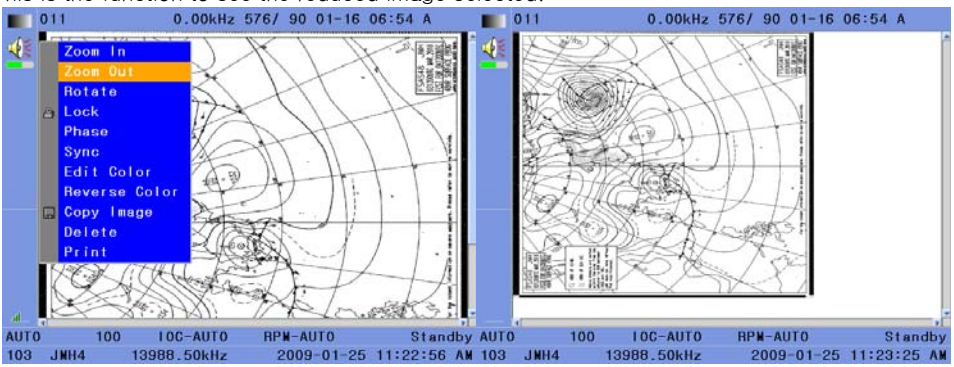
This is a function to see the enlarged image selected.



[Zoom In]

7.3 Zoom out

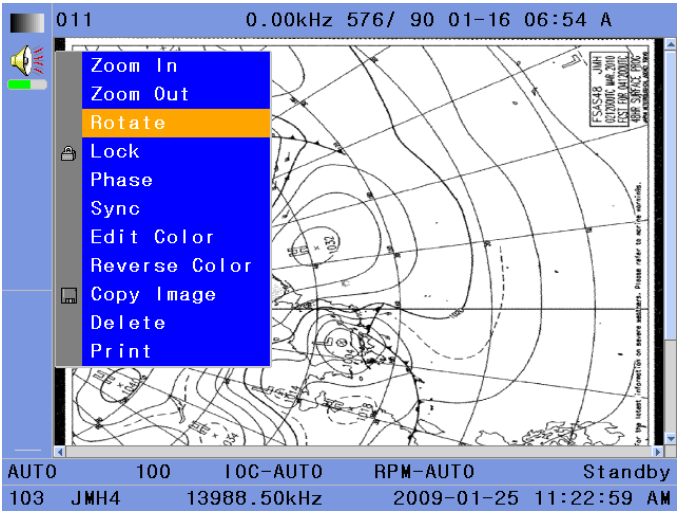
This is the function to see the reduced image selected.



[Zoom Out]

7.4 Rotate

This is a function to rotate the selected image.



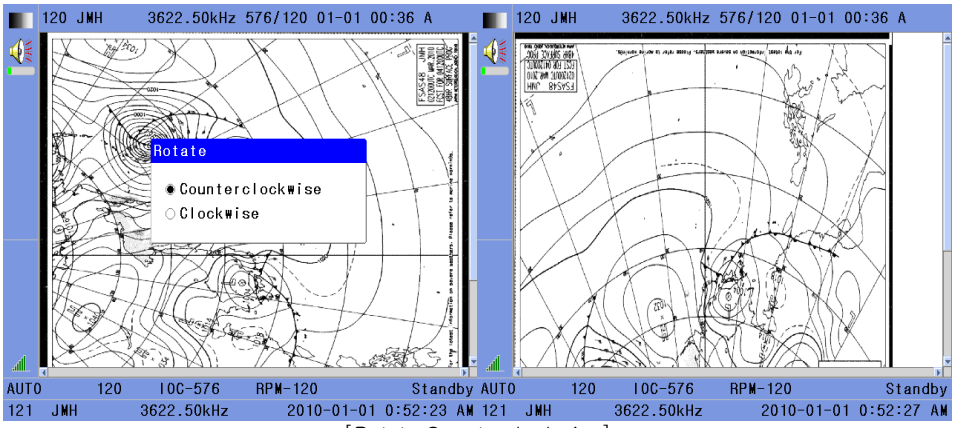
[Rotate]

※ User can rotate the image to clockwise direction or counterclockwise direction.

※ If user select 'Exit' after rotating the image, the image is saved automatically.

7.4.1 Counterclockwise

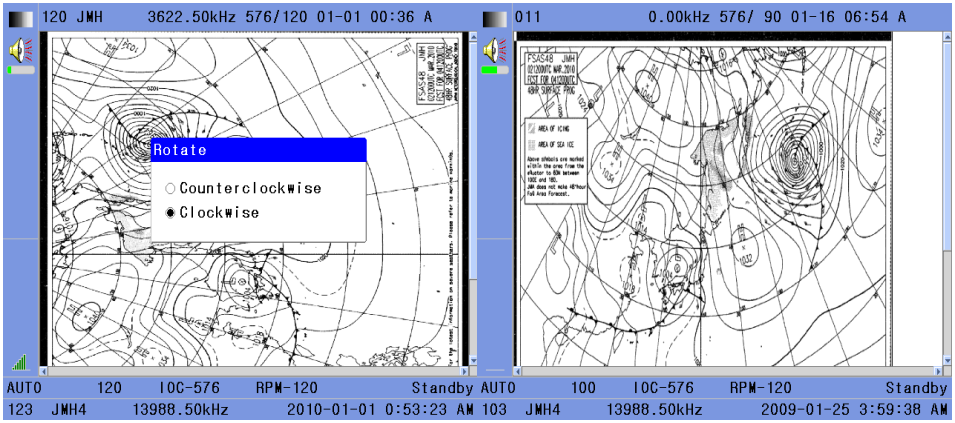
Select “Counterclockwise”, the image rotate to the left.



[Rotate Counterclockwise]

7.4.2 Clockwise

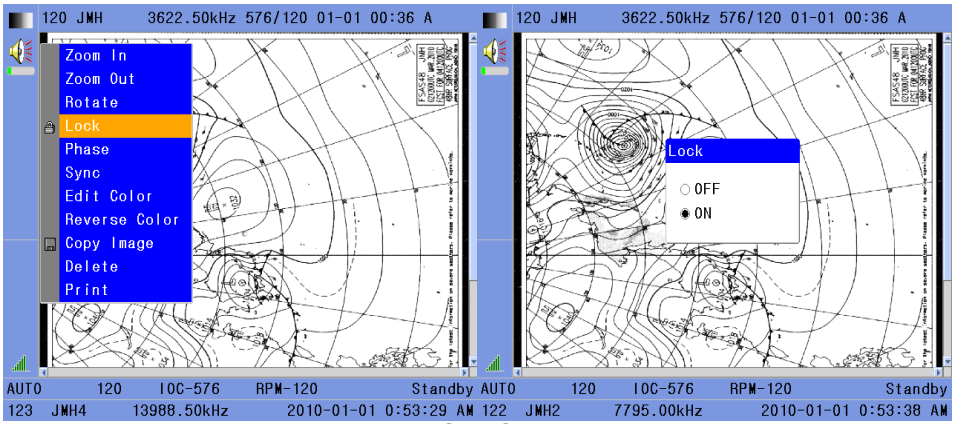
Select “Clockwise”, the image rotate to the right.



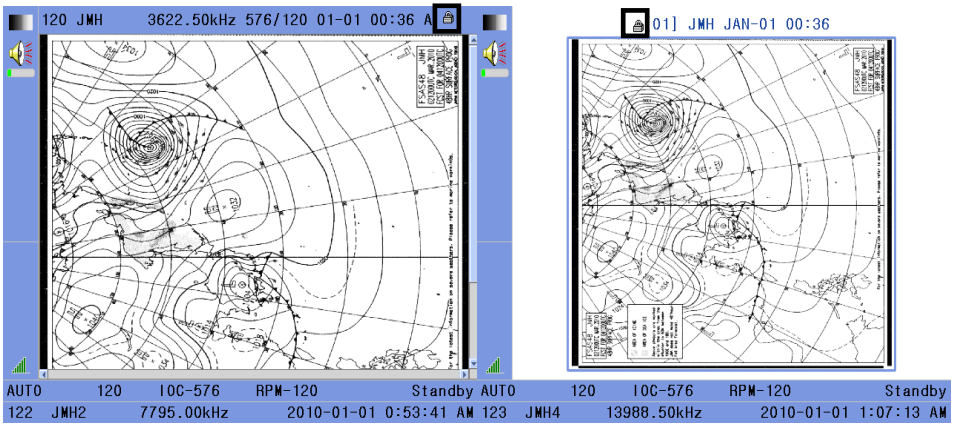
[Rotate Clockwise]

7.5 Lock

Function for protecting from the saved image delete.



[Lock]



[Lock Image]

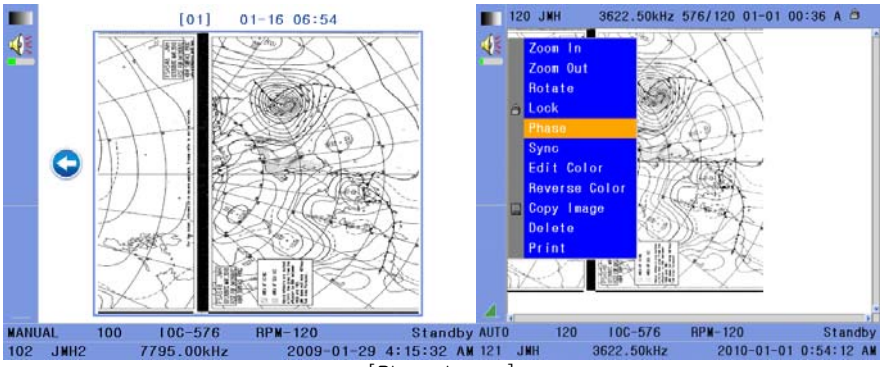
※Show the Lock Icon on Image when the image lock function work.

7.6 Phase

The SFAX start to receive the broadcast, the image will be separated two parts by Black Line called DEAD SECTOR the cause of the PHASE MISMATCHING.

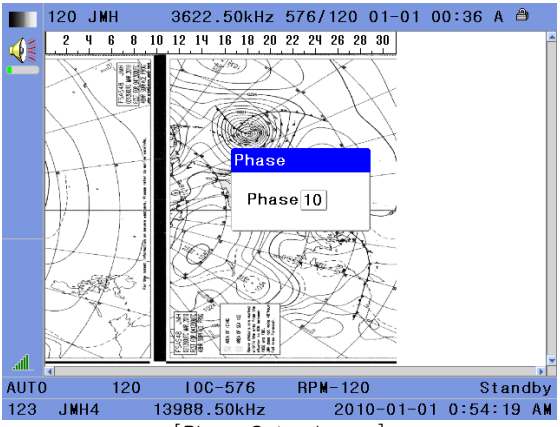
So, the Phase function can adjust 'PHASE MISMATCHING' when it will be happened.

(1) Select the button PHS on the keypad or 'Phase' on Menu



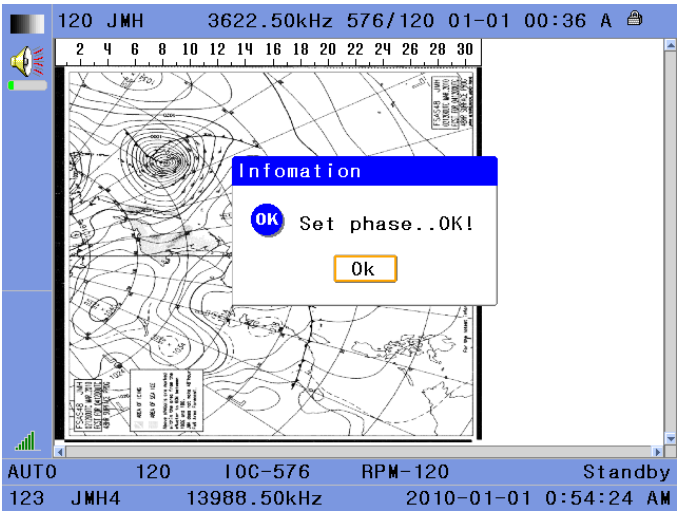
[Phase Image]

(2)Check the location of 'DEAD SECTOR' by graduated ruler and input the graduated ruler number with arrow button or keypad.

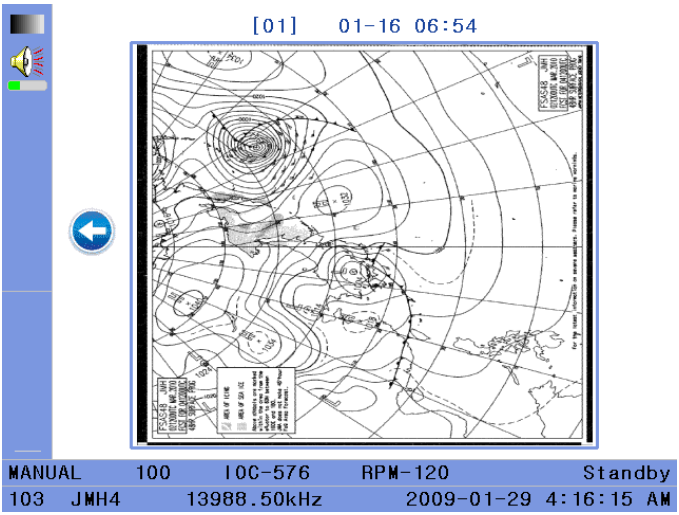


[Phase Setup Image]

※The sphere of value can be changed from"0 to 31 and 'DEAD SECTOR' location can be chaged by the value.



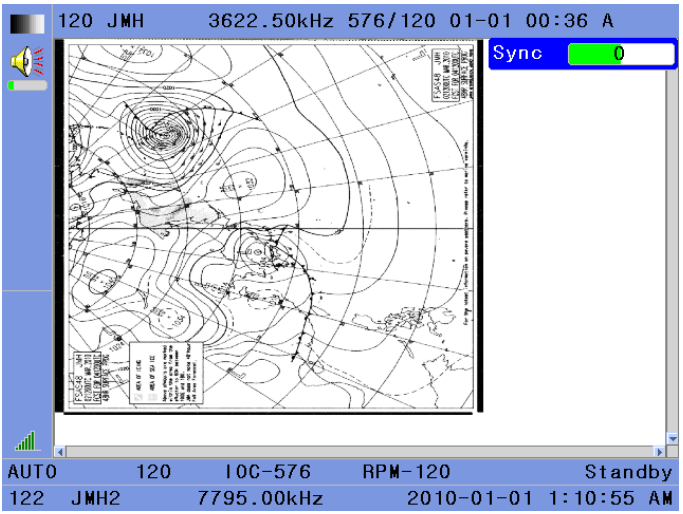
[Phase Setup confirm image]



[Adjusted Phase Image]

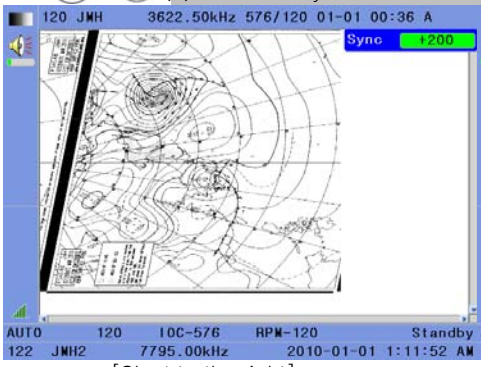
7.7 Sync

(1)This function for matching the dynamic climate by fine adjusting the Phase signal when 'DEAD SECTOR' slants.

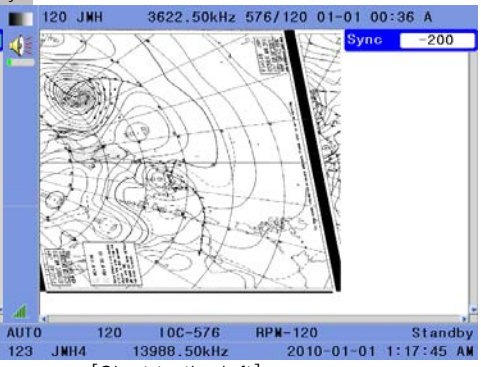


[Sync Menu]

(R) (L) (1) Can slant dynamic climate by .



[Slant to the right]



[Slant to the left]

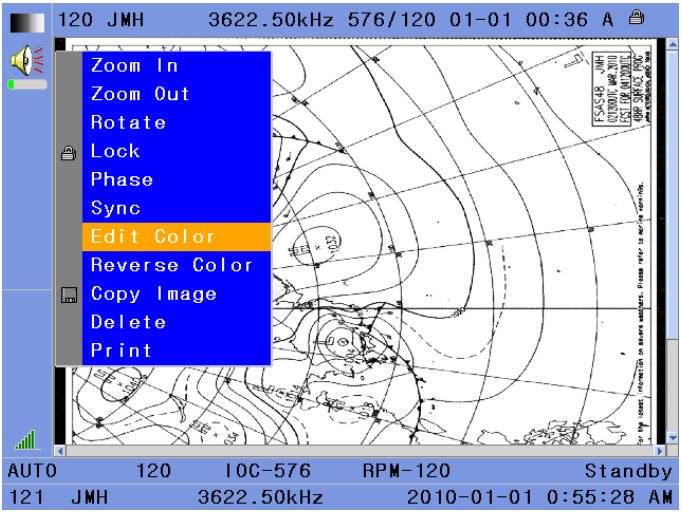
※The adjustment sphere can control from200 to -200.

※Use button (L) on the keypad, increase number of sync. and the image slant to the left.

※Use button (R) on the keypad, decrease number of sync. and the image slant to the right.

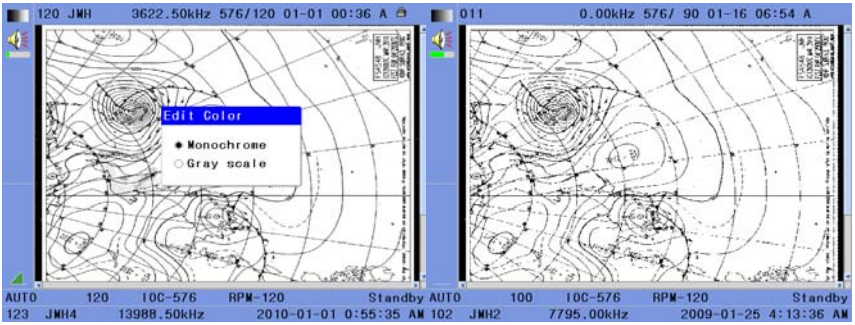
7.8 Edit Color

Edit the saved image's background color.

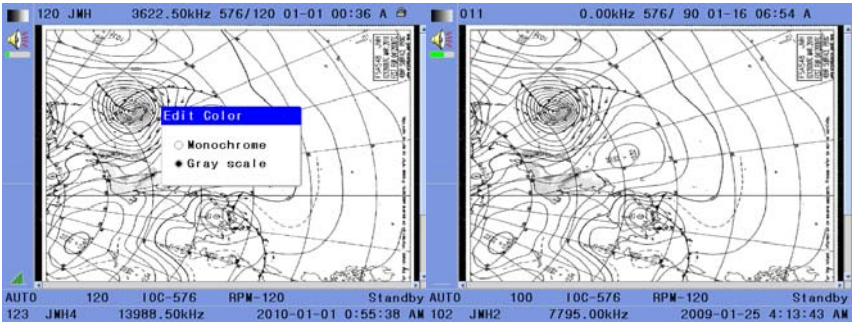


[Edit Color]

(1) Black background and gray background



[Monochrome background]

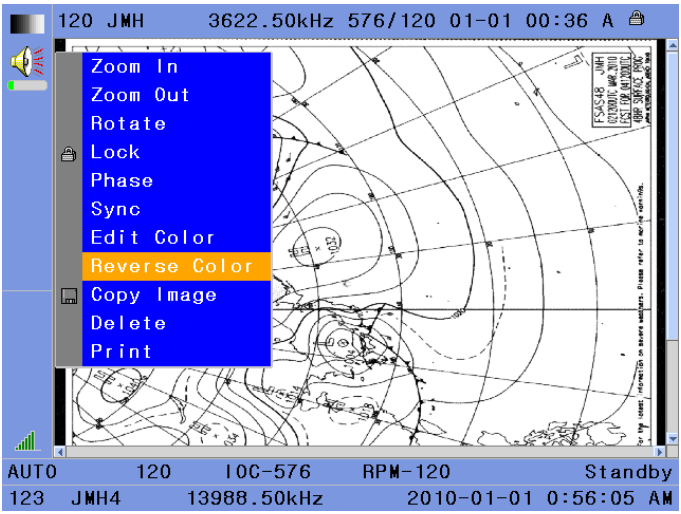


[Gray Background]

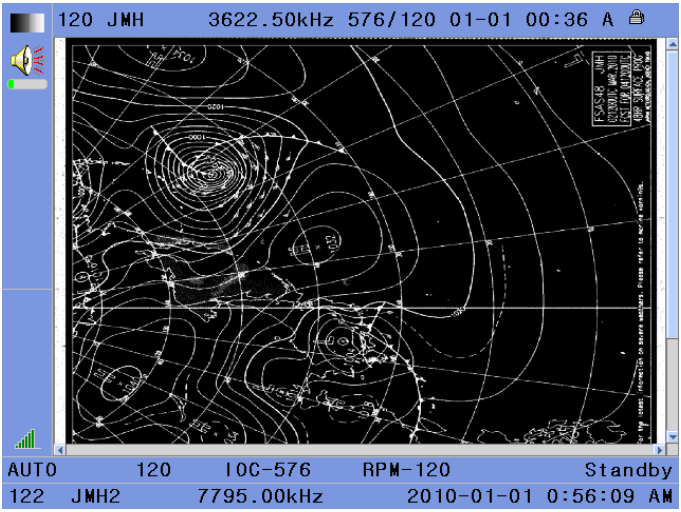
※Don't change the left top icon as like FAX Menu.

7.9 Reverse Color

Reverse color image on display.



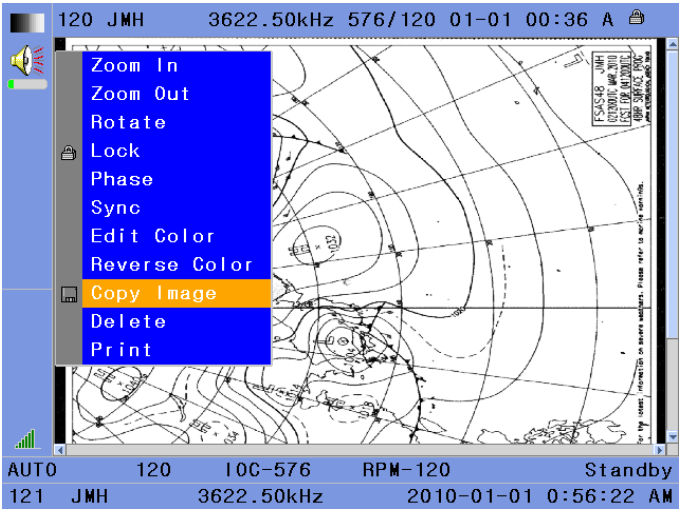
[Reverse Color Menu]



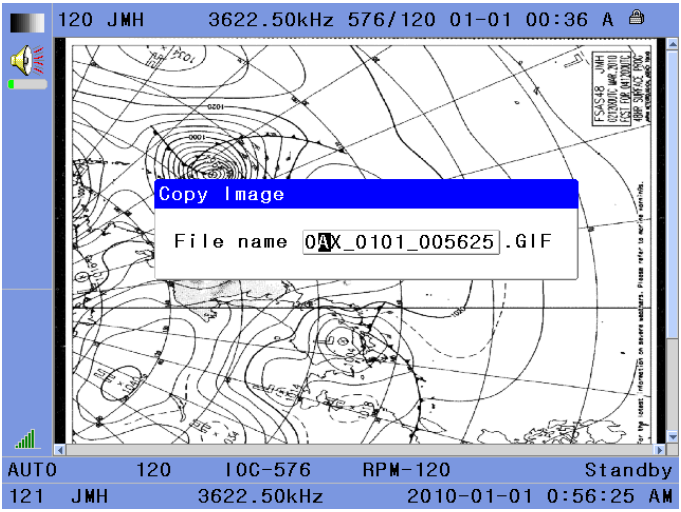
[Reversed Color Image]

7.10 Copy image

Copy the received image to SD Card.



[Copy Image Menu]

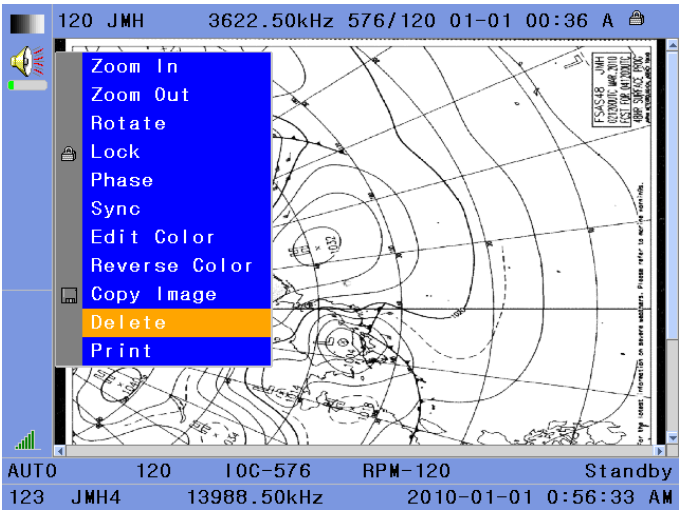


[Copy Image Display]

- The image will be saved as *.GIF file.

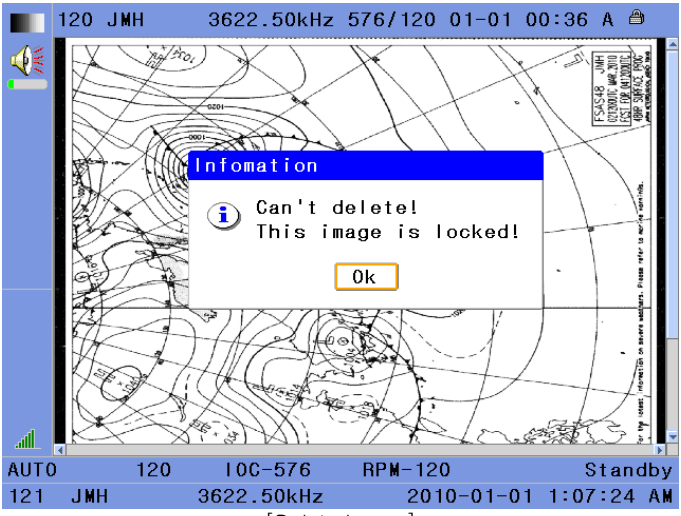
7.11 Delete Image

Function for deleting the select image.



[Delete Menu]

(1) Check again to delete or not before deleting image.



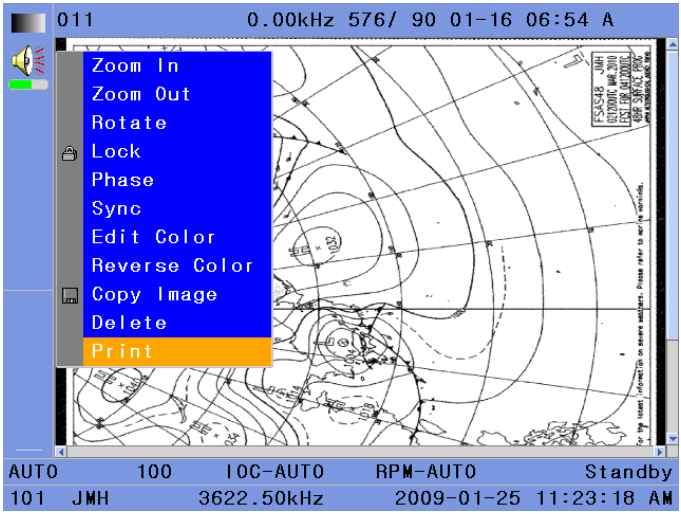
[Delete Image]

(2)Select 'Yes' and then delete the image.

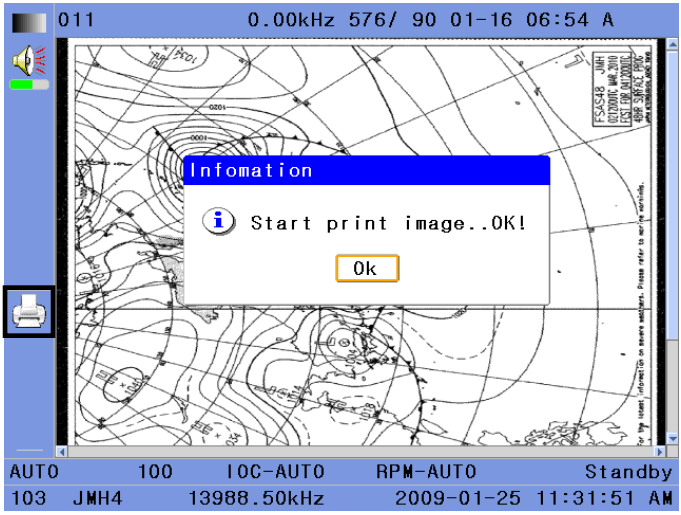
※the deleted image never can be restored.

7.12 Print

Function for printing received image.



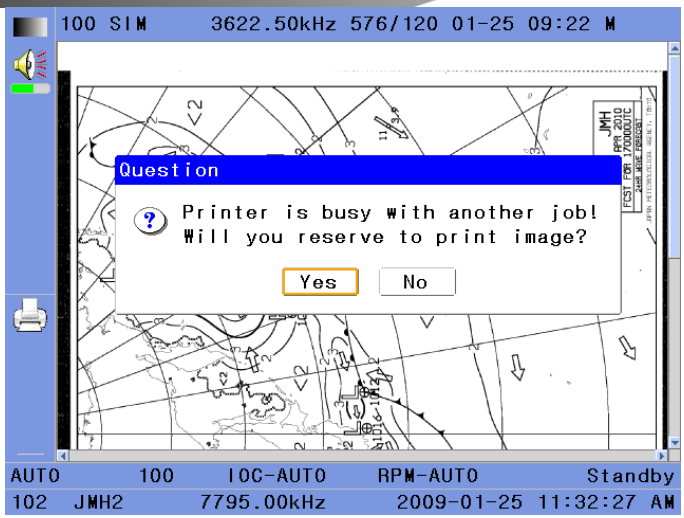
[printing mode]



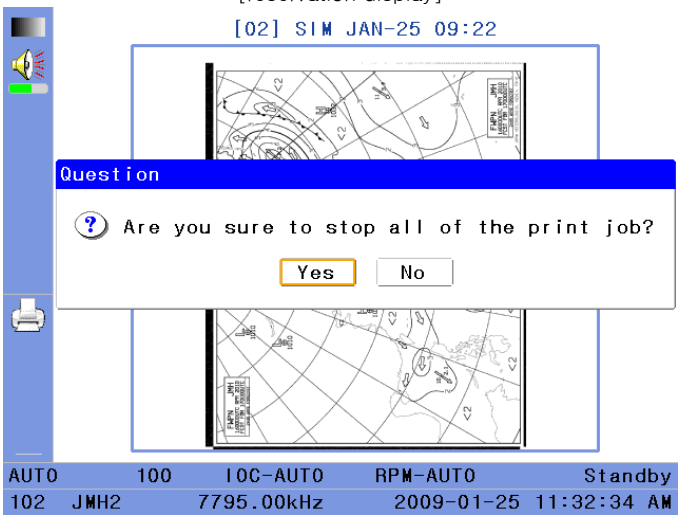
[printing Display]

※ When use print fuction, icon is appear and do process of printing.

※ When doing print also choose image and reserve print.


100 SIM 3622.50kHz 576/120 01-25 09:22 M
Question
Printer is busy with another job!
Will you reserve to print image?
Yes
No
AUTO 100 IOC-AUTO RPM-AUTO Standby
102 JMH2 7795.00kHz 2009-01-25 11:32:27 AM

[reservation display]

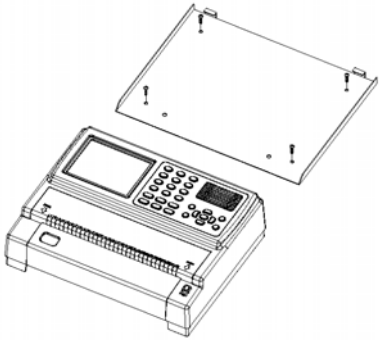
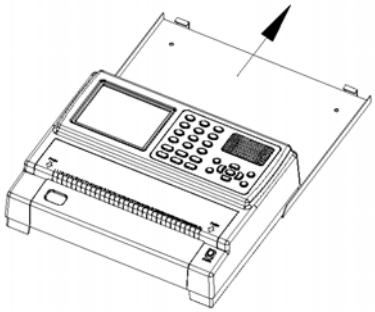
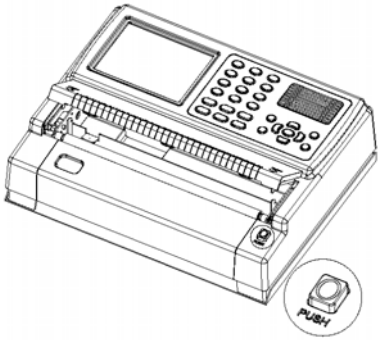

[02] SIM JAN-25 09:22
Question
Are you sure to stop all of the print job?
Yes
No
AUTO 100 IOC-AUTO RPM-AUTO Standby
102 JMH2 7795.00kHz 2009-01-25 11:32:34 AM

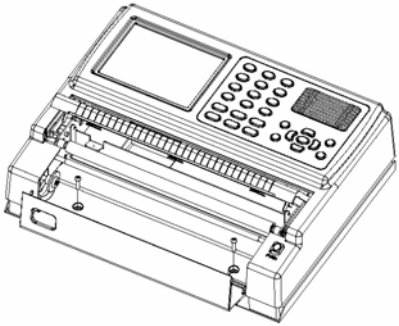
[Printing Cancel]

※ If cancel printing, all reserved image also will be canceled too.

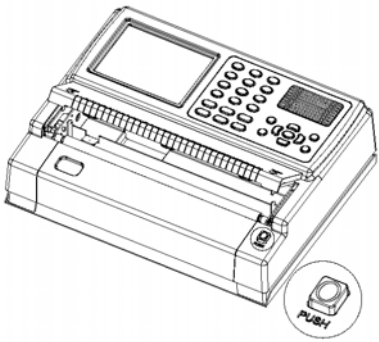
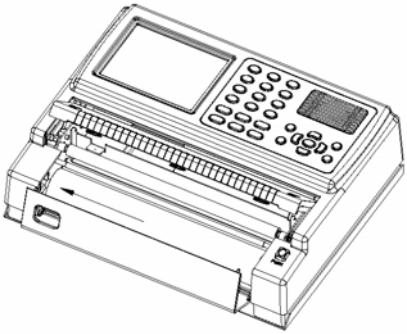
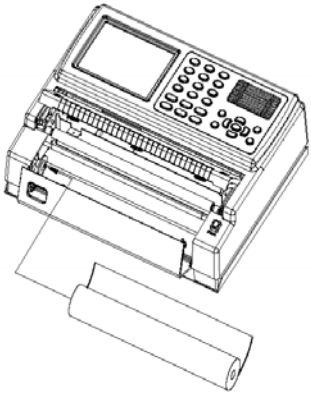
Chapter 8. USAGE of Printer and Installation

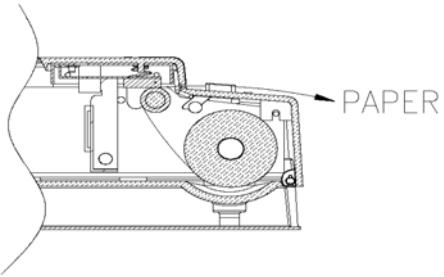
8.1 Installation

1		fix on the installation panel with M5*10mm pararel.
2		Push SFAX-500 to arrow direction
3		Open print head cover by push open button

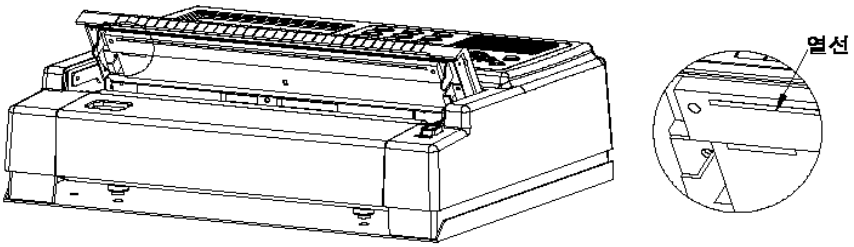
4		Open a print paper cover.
5		Fix on the installation panel with M4*14mm bolt
6		Close a print paper cover.

8.2 How to replace the paper

1		Press PUSH button.
2		Take empty roll paper out to arrow direction.
3		Insert new paper to arrow direction.

4		Put the paper under the sensor and pull the paper out.
5		Pull the paper out some and close the front cover.

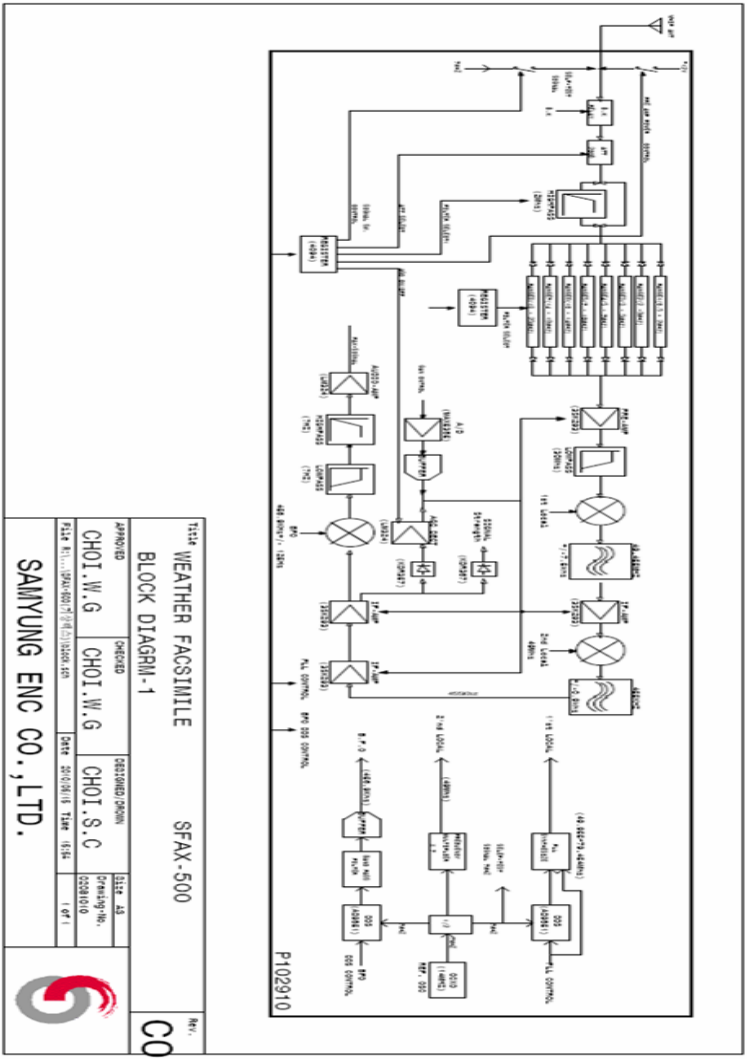
※ Caution for image print-out



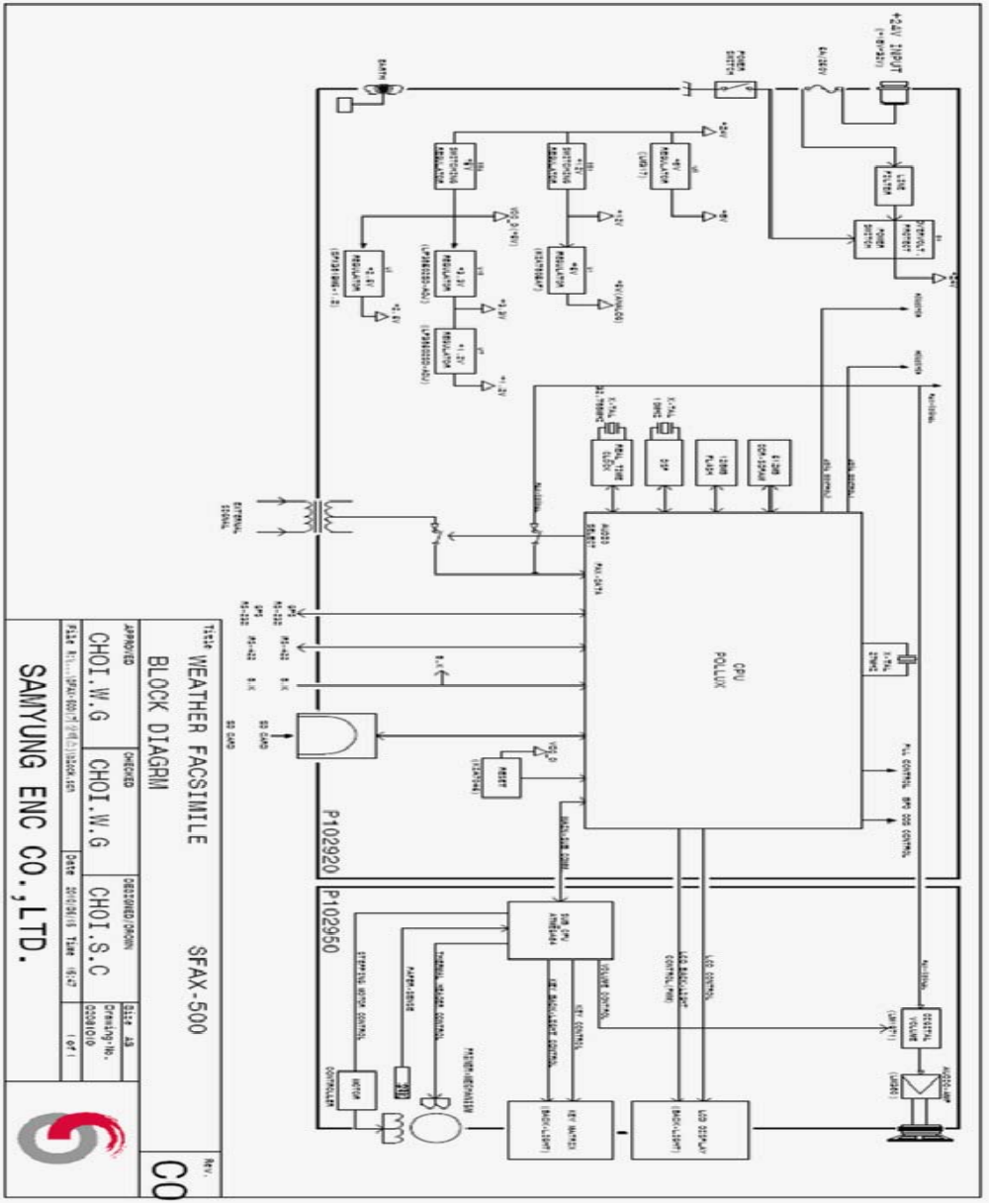
※ Power off and open a print head cover.
※ Wipe a heater line by using a soft cloth putting alcohol if there's a line or spot on printed image.
※ Do not touch a heater line as the printing quality can be no good.
※ Do not touch a heater line after print-out as it is hot.

Chapter 9 Circuit Diagram

9.1 Overview



[SFAX-500 RF-BOARD]

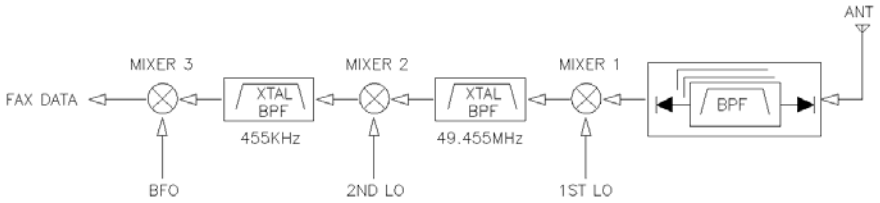


[SFAX-500 MAIN-BOARD]

- SFAX-500 consists front keyboard, LCD display, receiver & synthesizer, Control, power and printer .
- Power: DC +22V ~ +31V (24V: -10%, +30%)

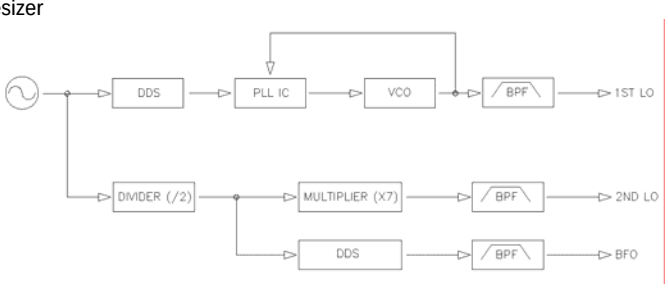
9.2 Circuit Description

(1) Receiver



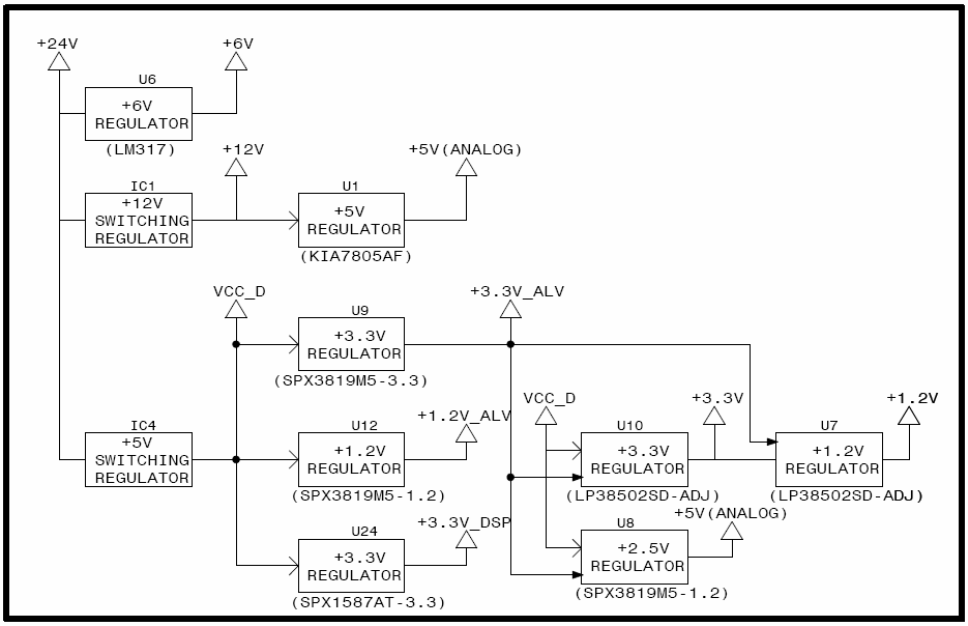
[Reception Block Diagram]

(2) Local Synthesizer



[Synthesizer Block Diagram]

(3) Power Circuit



[Power Circuit Diagram]

* Power circuit: Power circuit receives DC24V and supplies 24V through a protection and regulated voltage circuit.

* Main Power Circuit & Protection and Sensor Circuit are contains.

Chapter 10 TROUBLESHOOTING

10.1 . Overview

● The most of reason which causes trouble is related to mechanical and electrical reasons in the internal and external of device and these reasons can be prevented by periodical inspection and maintenances. Also this device equips with all kid of protection circuit to protect circuits and parts. However, if there are any troubles that caused a difficulty to operate then it needs to be repaired in fast and rational manner. To maintain its original performance and life expectancy, periodical inspection and maintenance is required. Please be aware of matters to be attended as below before inspection and maintenance to avoid improper maintenances.

10.2. Measuring Instrument

● This device is designed accordingly to international wireless communication laws and measuring instruments for inspection and maintenance is needed to be inspected and tested by an authorized agency. For daily inspection and maintenance, following measuring instruments are needed.

	Measuring Instrument for inspection and repair
1	A multi meter for the measurement of resistor, voltage and current
2	A frequency Counter that can measure 100MHz bandwidth
3	An oscilloscope that can measure 100MHz bandwidth
4	A Signal generator that can measure 100MHz bandwidth
5	Others

[Table 4. The list of measuring instruments for inspection and repair]

10.3 Inspection and Maintenance

10.3.1 Antenna

● If there is difficulty in communication caused by noise, signal reception and so on, check an antenna first whether there is any defection or not and then check followings.
(1) Do self test.
(2) Whether a whip antenna is properly connected.
(3) Whether metallic object is near an antenna or not.
(4) Whether the connection and insulation between an antenna and receiver is proper or not.

10.3.2 Power

● If there is no display even though the power is on, following are needed to be checked.
(1) Whether fuse is disconnected or not (The rated current of fuse is 5A)
(2) Whether the power connector is properly connected or not. (If the polarity of power is opposite, the device will not work)
(3) Check the voltage in the power supply connector. (If it is between DC 22~31V, it is normal.)

10.3.3 Receiver

Make sure all interface devices are properly connected.

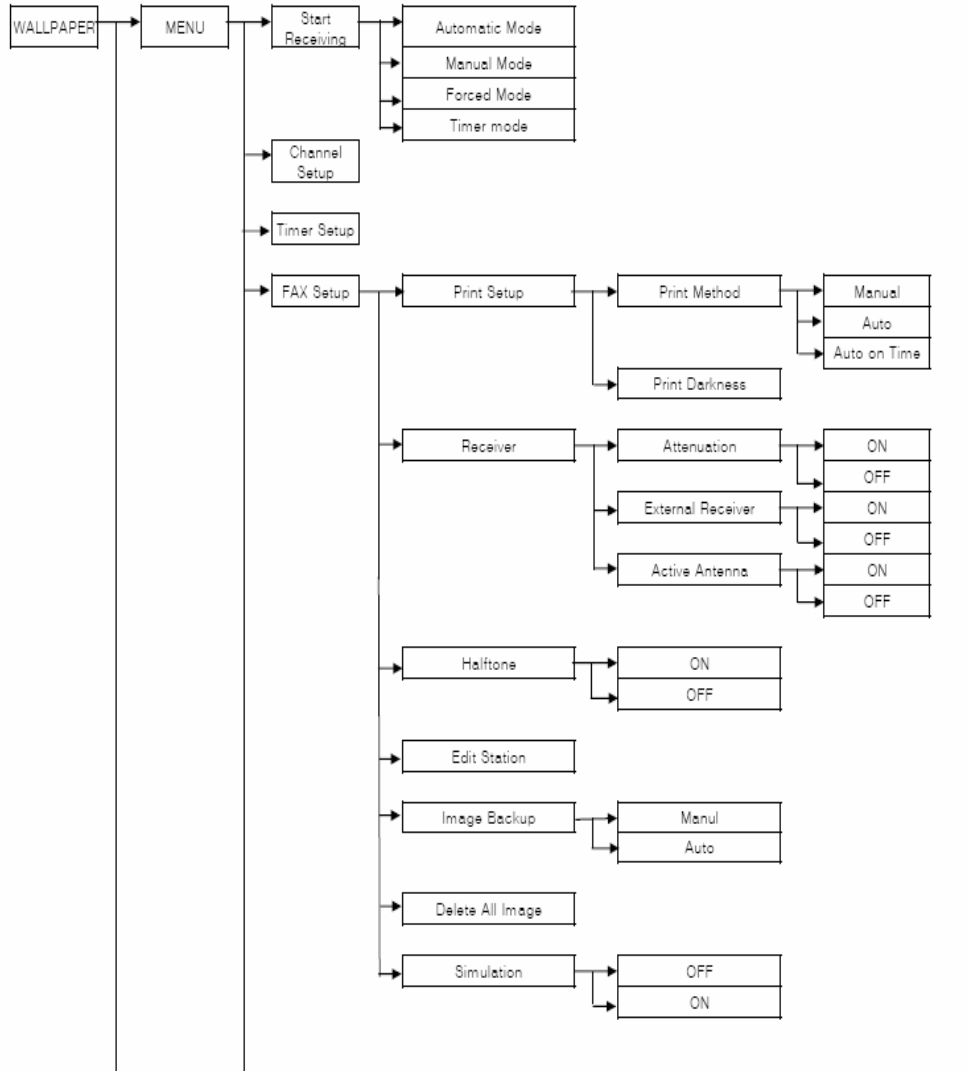
(1) Do self test.

(2) Check the connection between P102910 PCB in device and the cable replace with one if the board is defected.

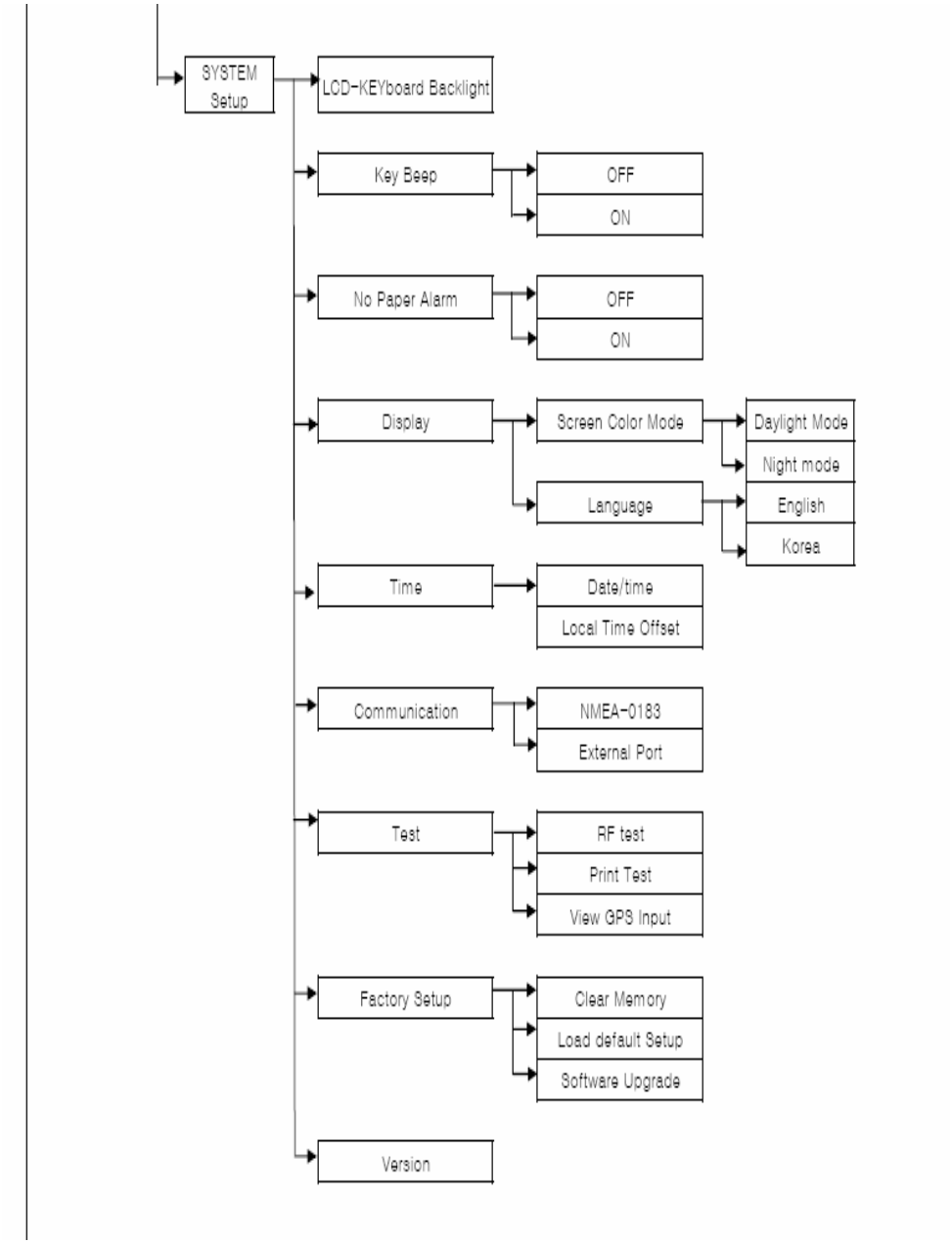
Chapter 11. Appendix

11.1 MENU TREE

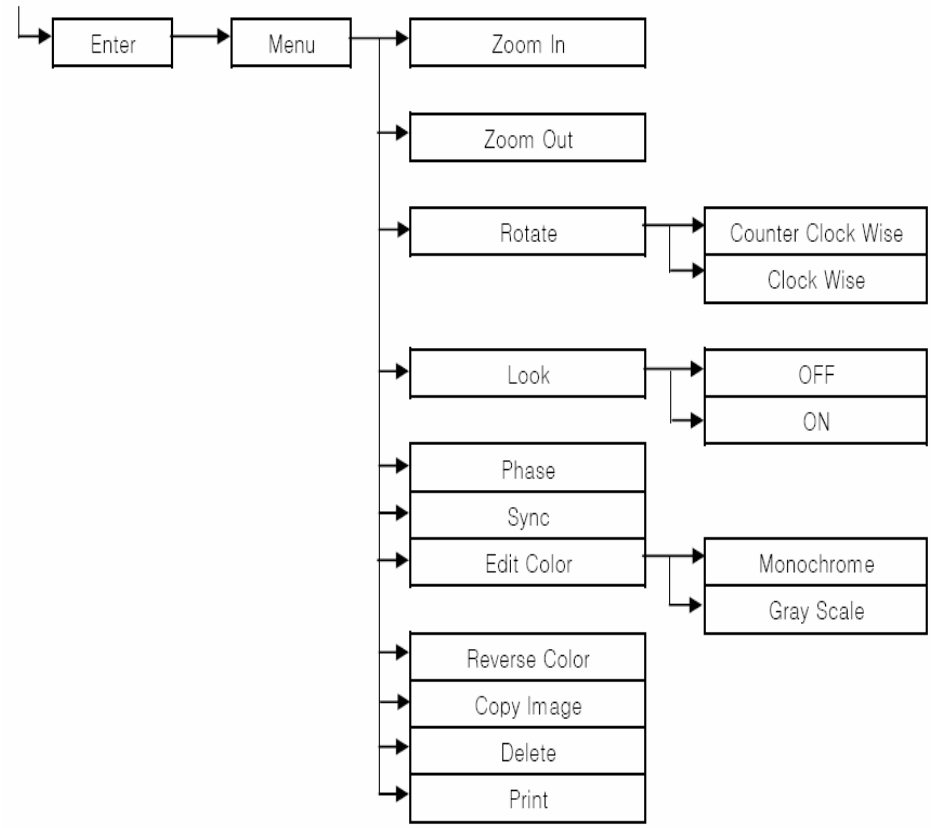
11.1.1 Menu



11.1.2 System Setup



11.1.3 Image Menu



11.2 World Major Weather Fax Frequency

[World Map]

11.2.1 ASIA

BEIJING(PEKING)-CHINA

CALL SIGNS	FREQUENCIES	TIME	RPM/IOC
BAF6	5526.9 kHz		120/576
BAF36	8121.9 kHz		120/576
BAF4	10116.9 kHz		120/576
BAF8	14366.9 kHz		120/576
BAF9	16025.9 kHz		120/576
BAF33	18236.9 kHz		120/576

BEIJING(PEKING)-CHINA

CALL SIGNS	FREQUENCIES	TIME	RPM/IOC
3SD	8461.9 kHz		120/576
3SD	12831.9 kHz		120/576
3SD	16903.9 kHz		120/576

TOKYO-JAPAN

CALL SIGNS	FREQUENCIES	TIME	RPM/IOC
JMH	3622.5 kHz	ALLBROADCAST TIMES	120/576
JMH2	7795 kHz	ALLBROADCAST TIMES	120/576
JMH4	13988.5 kHz	ALLBROADCAST TIMES	120/576

PEVEK-CHUKOTKA PENINSULA

CALL SIGNS	FREQUENCIES	TIME	RPM/IOC
	148 kHz	ALLBROADCAST TIMES	90/576

TAIPEI-REPUBLIC OF CHINA

CALL SIGNS	FREQUENCIES	TIME	RPM/IOC
BMF	4616 kHz		120/576
BMF	8140 kHz		120/576
BMF	13900 kHz		120/576
BMF	18560 kHz		120/576

SEOUL-REPUBLIC OF KOREA

CALL SIGNS	FREQUENCIES	TIME	RPM/IOC
HILL2	3585 kHz	1200-0000 UTC	120/576
HILL2	5857.5 kHz	ALLBROADCAST TIMES	120/576
HILL2	7433.5 kHz	ALLBROADCAST TIMES	120/576
HILL2	9165 kHz	ALLBROADCAST TIMES	120/576
HILL2	13570 kHz	0000-1200 UTC	120/576

BANGKOK-THAILAND

CALL SIGNS	FREQUENCIES	TIME	RPM/IOC
HSW64	7395.0 kHz		120/576

KYODO NEWS AGENCY-JAPAN/SINGAPORE

CALL SIGNS	FREQUENCIES	TIME	RPM/IOC
JJC	4316 kHz	ALLBROADCAST TIMES	
JJC	8467.5 kHz	ALLBROADCAST TIMES	
JJC	12745.5 kHz	ALLBROADCAST TIMES	
JJC	16971 kHz	ALLBROADCAST TIMES	
JJC	17069.6 kHz	ALLBROADCAST TIMES	
JJC	22542 kHz	ALLBROADCAST TIMES	
9VF/252	16035 kHz	0740-1010, 1415-1815	
9VF/252	17430 kHz	0740-1010, 1415-1815	

NORTHWOOD-UNITED KINGDOM (PERSIAN GULF)

CALL SIGNS	FREQUENCIES	TIME	RPM/IOC
GYA	6834 kHz	1800-0800 UTC	120/576
GYA	12390 kHz	ALLBROADCAST TIMES	120/576
GYA	18261 kHz	0800-1800 UTC	120/576

11.2.2 SOUTH AMERICA

RIO DE JANEIRO-BRAZIL

CALL SIGNS	FREQUENCIES	TIME	RPM/IOC
PWZ-33	12665 kHz	ALLBROADCAST TIMES	120/576
PWZ-33	16978 kHz	ALLBROADCAST TIMES	120/576

VALPARAISO PLAYA ANCHA-CHILE

CALL SIGNS	FREQUENCIES	TIME	RPM/IOC
CBV	4228 kHz	ALLBROADCAST TIMES	120/576
CBV	8677 kHz	ALLBROADCAST TIMES	120/576
CBV	17146.4 kHz	ALLBROADCAST TIMES	120/576

11.2.3 NORTH AMERICA

HALIFAX,NOVA SCOTIA-CANADA

CALL SIGNS	FREQUENCIES	TIME	RPM/IOC
CHF	122.5 kHz	ALLBROADCAST TIMES	120/576
CHF	4271 kHz	ALLBROADCAST TIMES	120/576
CHF	6496.4 kHz	ALLBROADCAST TIMES	120/576
CHF	10536 kHz	ALLBROADCAST TIMES	120/576
CHF	13510 kHz	ALLBROADCAST TIMES	120/576

IQALUIT,N.W.T-CANADA

CALL SIGNS	FREQUENCIES	TIME	RPM/IOC
VFF	3253 kHz	2100-2330 UTC	120/576
VFF	7710 kHz	0010-0900 UTC	120/576

RESOLUTE,N.W.T-CANADA

CALL SIGNS	FREQUENCIES	TIME	RPM/IOC
VFR	3253 kHz	0010-0900 UTC	120/576
VFR	7710 kHz	2100-2330 UTC	120/576

SYDNEY,NOVA SCOTIA-CANADA

CALL SIGNS	FREQUENCIES	TIME	RPM/IOC
VCO	4416 kHz	1121-1741 UTC	120/576
VCO	6915.1 kHz	2200-2331 UTC	120/576

INUVIK-CANADA

CALL SIGNS	FREQUENCIES	TIME	RPM/IOC
VFA	8457.8 kHz		120/576

KODIAK,ALASKA-U.S.A

CALL SIGNS	FREQUENCIES	TIME	RPM/IOC
NOJ	2054 kHz	ALLBROADCAST TIMES	120/576
NOJ	4298 kHz	ALLBROADCAST TIMES	120/576
NOJ	8459 kHz	ALLBROADCAST TIMES	120/576
NOJ	12412.5 kHz	ALLBROADCAST TIMES	120/576

PT.REYES,CALIFORNIA-U.S.A

CALL SIGNS	FREQUENCIES	TIME	RPM/IOC
NMC	4346 kHz	0140-1608 UTC	120/576
NMC	8682 kHz	ALLBROADCAST TIMES	120/576
NMC	12786 kHz	ALLBROADCAST TIMES	120/576
NMC	17151.2 kHz	ALLBROADCAST TIMES	120/576
NMC	22527 kHz	1840-2356 UTC	120/576

NOW ORLEANS,LOUISANA-U.S.A

CALL SIGNS	FREQUENCIES	TIME	RPM/IOC
NMG	4317.9 kHz	ALLBROADCAST TIMES	120/576
NMG	8503.9 kHz	ALLBROADCAST TIMES	120/576
NMG	12789.9 kHz	ALLBROADCAST TIMES	120/576
NMG	17146.4 kHz	1200-2045 UTC	120/576

BOSTON,MASSACHUSETTS-U.S.A

CALL SIGNS	FREQUENCIES	TIME	RPM/IOC
NMF	4235 kHz	0230z-1028z	120/576
NMF	6340.5 kHz	ALLBROADCAST TIMES	120/576
NMF	9110 kHz	ALLBROADCAST TIMES	120/576
NMF	12750 kHz	1400z-2228z	120/576

11.2.4 PACIFIC OCEAN BASIN

CHARLEVILLE-AUSTRALIA

CALL SIGNS	FREQUENCIES	TIME	RPM/IOC
VMC	2628 kHz	0900-1900	120/576
VMC	5100 kHz	ALLBROADCAST TIMES	120/576
VMC	11030 kHz	ALLBROADCAST TIMES	120/576
VMC	13920 kHz	ALLBROADCAST TIMES	120/576
VMC	20469 kHz	1900-0900	120/576

WILUNA-AUSTRALIA

CALL SIGNS	FREQUENCIES	TIME	RPM/IOC
VMW	5575 kHz	1100-2100	120/576
VMW	7535 kHz	ALLBROADCAST TIMES	120/576
VMW	10555 kHz	ALLBROADCAST TIMES	120/576
VMW	15615 kHz	ALLBROADCAST TIMES	120/576
VMW	18060 kHz	2100-1100	120/576

WELLINGTON-NEW ZEALAND

CALL SIGNS	FREQUENCIES	TIME	RPM/IOC
ZKLF	3247.4 kHz	0945-1700	120/576
ZKLF	5807 kHz	ALLBROADCAST TIMES	120/576
ZKLF	9459 kHz	ALLBROADCAST TIMES	120/576
ZKLF	13550.5 kHz	ALLBROADCAST TIMES	120/576
ZKLF	16340.1 kHz	2145-0500	120/576

HONOLULU,HAWAII-U.S.A

CALL SIGNS	FREQUENCIES	TIME	RPM/IOC
KVM70	9982.5 kHz	0519-1556	120/576
KVM70	11090 kHz	ALLBROADCAST TIMES	120/576
KVM70	16135 kHz	1719-0356	120/576

11.2.5 EUROPE

ATHENS-GREECE

CALL SIGNS	FREQUENCIES	TIME	RPM/IOC
SVJ4	4481 kHz		120/576
SVJ4	8105 kHz		20/576

MURMANSK-RUSSIA

CALL SIGNS	FREQUENCIES	TIME	RPM/IOC
RBW41	5336 kHz		
RBW41	6445.5 kHz	ALLBROADCAST TIMES	
RBW41	7908.8 kHz	1900-0600	
RBW48	10130 kHz	0600-1900	

HAMBURG/PINNEBERG-GERMANY

CALL SIGNS	FREQUENCIES	TIME	RPM/IOC
DDH3	3855 kHz	ALLBROADCAST TIMES	120/576
DDK3	7880 kHz	ALLBROADCAST TIMES	120/576
DDK6	13882.5 kHz	ALLBROADCAST TIMES	120/576

NORTHWOOD-UNITED KINGDOM

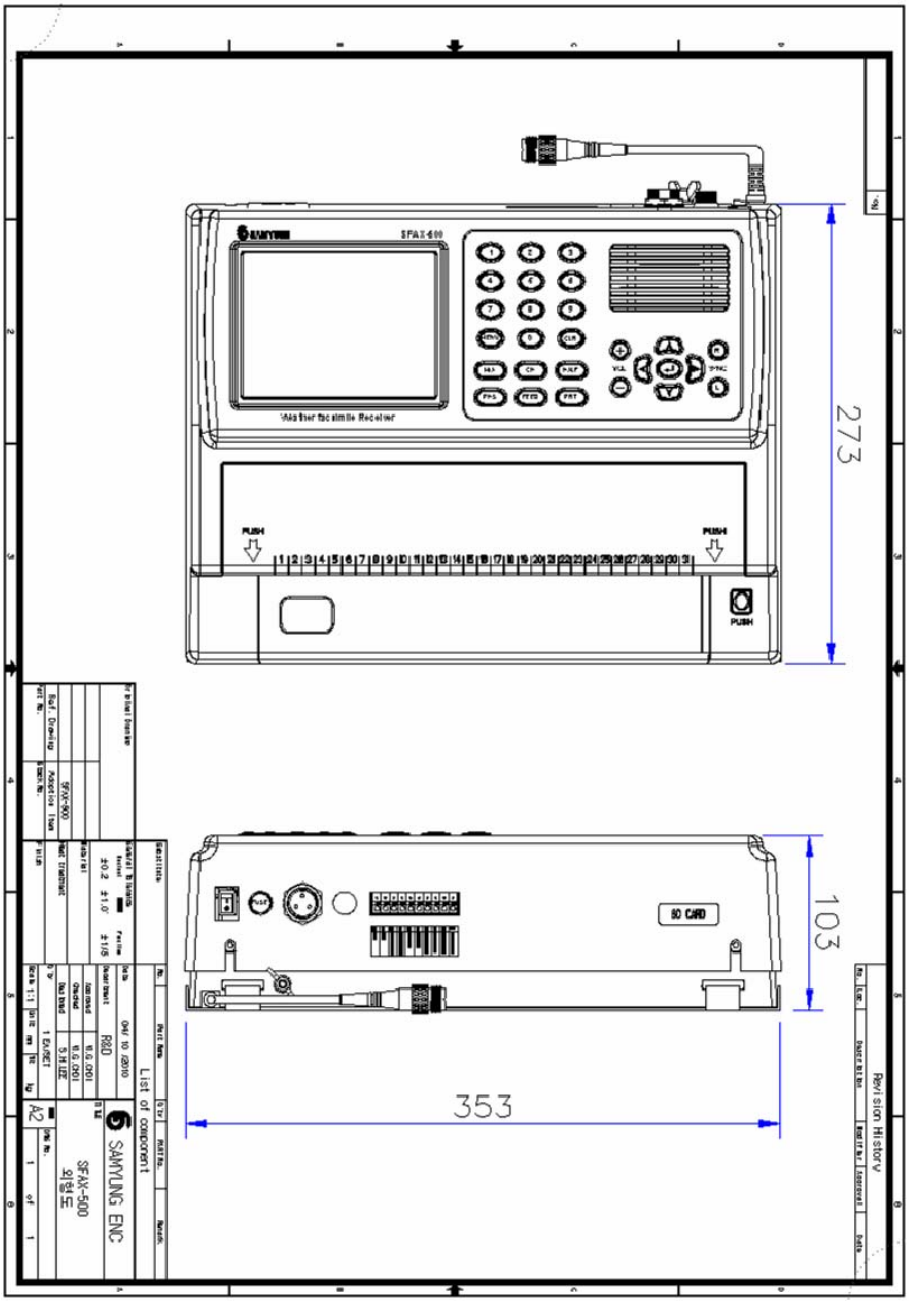
CALL SIGNS	FREQUENCIES	TIME	RPM/IOC
GYA	2618.8 kHz	2000-0600 UTC	120/576
GYA	4610 kHz	ALLBROADCAST TIMES	120/576
GYA	8040 kHz	ALLBROADCAST TIMES	120/576
GYA	11086.5 kHz	0600-2000 UTC	120/576

11.2.6 AFRICA

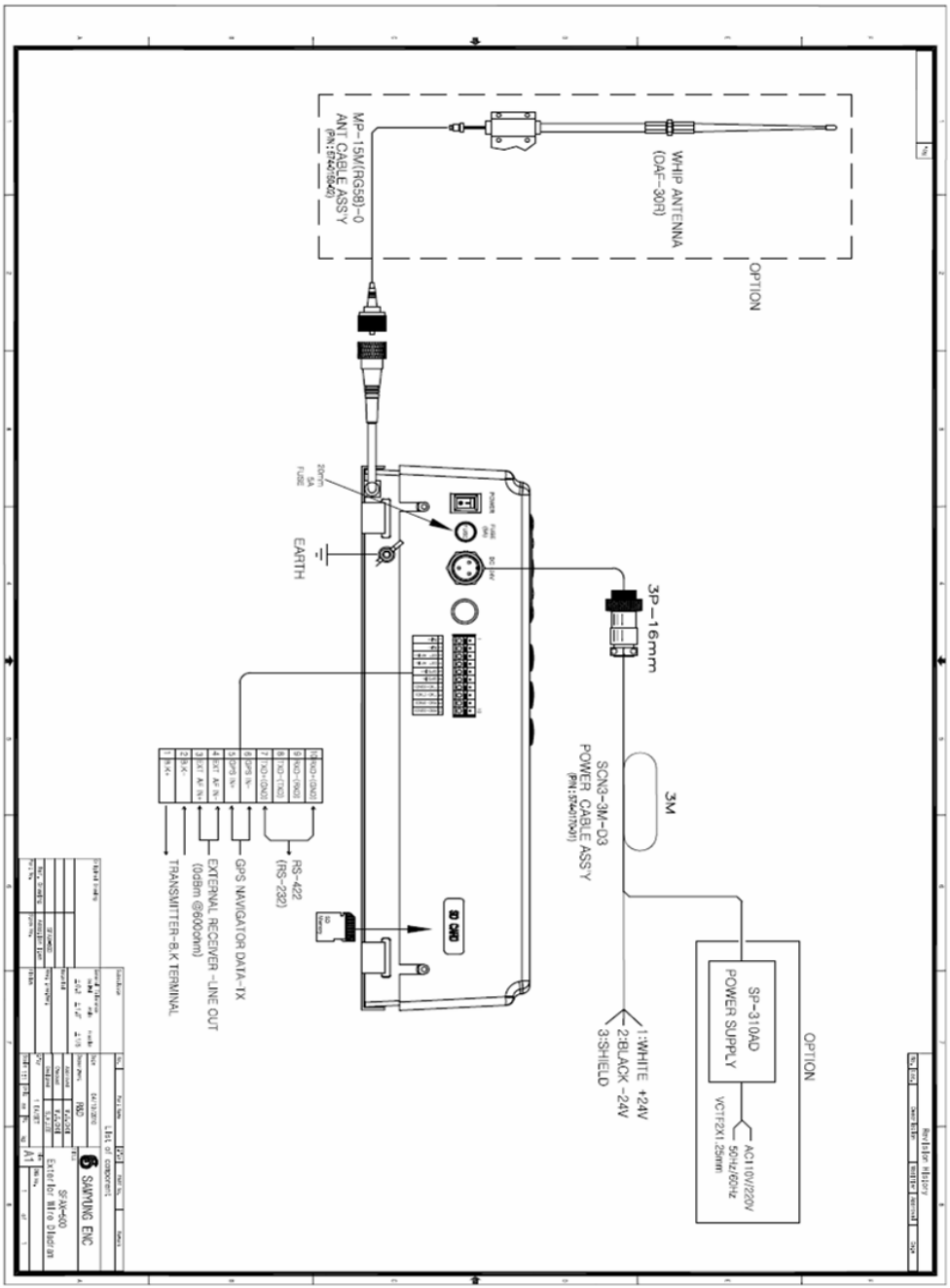
CAPENAVAL-SOUTH AFRICA

CALL SIGNS	FREQUENCIES	TIME	RPM/IOC
ZSJ	4014 kHz	16Z-06Z (WHEN AVILABLE)	120/576
ZSJ	7508 kHz	ALLBROADCAST TIMES	120/576
ZSJ	13538 kHz	ALLBROADCAST TIMES	120/576
ZSJ	18238 kHz	06Z-16Z (WHEN AVILABLE)	120/576

11.3 External Diagram



11.4 External Connection Diagram



11.5 Internal Connection Diagram